CHALLENGE

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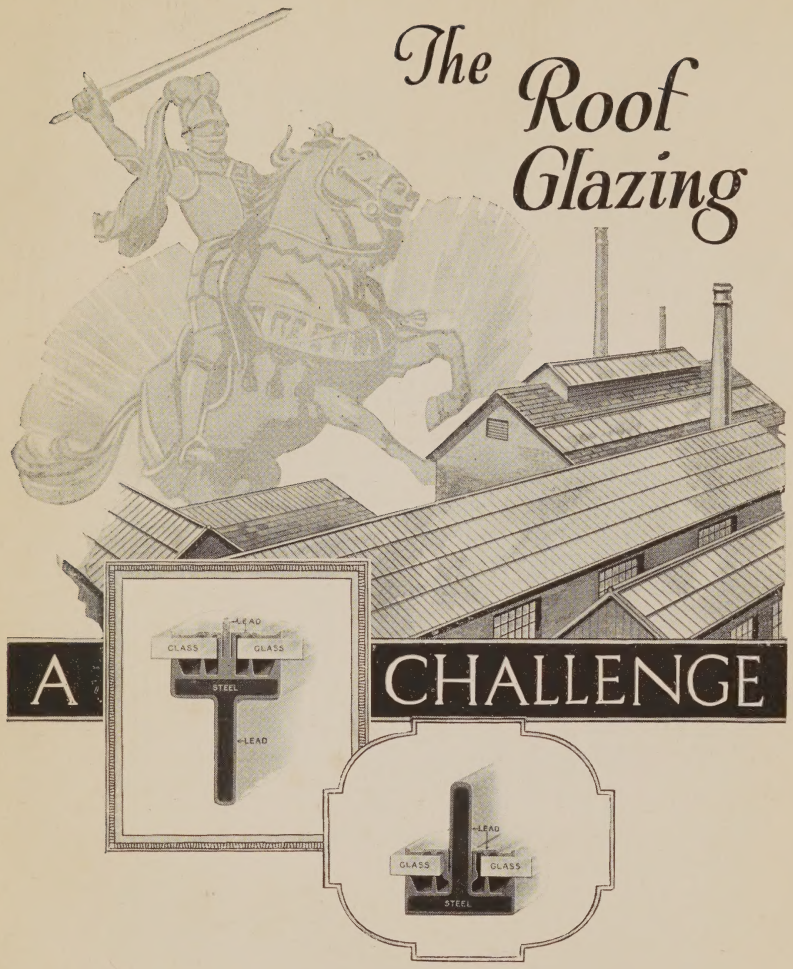
All Section Books and Catalogues previous to 4th Edition superseded.

September, 1929. 5th Edition.

*See separate Brochure for price-lists and further details.

The Roof Glazing



The British Challenge Glazing Co.

BRANCH OF
ROBINSON, KING & BRITISH CHALLENGE GLAZING CO., LTD.

OFFICE AND WORKS:

GROVE GLASS WORKS, MARSHGATE LANE,
STRATFORD, LONDON, E. 15.

Telegrams:
"ASTRAGAL, PHONE, LONDON."

Telephone:
MARYLAND 4161 (5 lines).

SOUTH WALES AGENTS
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PATENT GLAZING is a term indicating a method of supporting and securing glass in glazing bars without the use of putty. It consists of the patent glazing bars and glass. Roof members such as ridges, hips, &c., are not parts of patent glazing, although very essential incidentals.

The patent glazing bars are designed to support the glass only, and should not be used as constructional members.

While primarily intended for use in roof work, the following pages indicate the wide field in which the best types can be used.

There are two main types of patent glazing bars, *i.e.*:—

(*a*) A steel bar covered with a jointless lead sheath, which, while completely clothing the bar, also forms the seating and cap for securing the glass. Wood bars are also made with similar lead caps.

(*b*) A steel or wood bar with a hard metal cap secured to the tops of the bars with screws and nuts. These caps leave portions of the bars unprotected.

We manufacture the former type only, as it gives a perfect result, while the latter has many inherent deficiencies, such as exposure of the bars, &c.

PATENT GLAZING has been in use in this country for about 40/45 years. In its infancy, while being greatly in advance of the wood or steel bar and putty, there were several important defects. ALL these defects are now known and guarded against.

It is pleasing to be able to record that while there are several excellent systems produced in Great Britain, very few are produced abroad. Also that while those produced in Great Britain are sent all over the world, the foreign systems are not considered worthy of use here.

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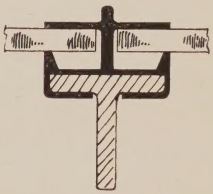
Development of the "CHALLENGE" System.

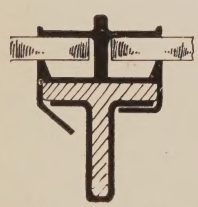
In comparing various types of Patent Glazing Bars, little doubt need arise as to whether any of the well-known types of lead-covered bars are water-tight.

The important points to-day are the cost of maintenance and "length of life." The initial cost of installation is subsidiary to these.

The "Challenge" system of Patent Glazing has been evolved from an experience spread over 40 years, and it may be interesting to follow the developments which have led up to the bar we now manufacture, and which gives such excellent results.



When first produced, the "Challenge" bar consisted of a T with a drawn lead cap to which were attached the wings which secured the glass. A centre core of lead was provided which was (and still is) of ample strength to support boards and men's weight. This left a portion of the T exposed.



The next step introduced a strip of sheet lead which covered the previously exposed portion of the T. Thus two lap joints were used.

These laps were then eliminated by using a lead cap and cover (termed lead bag, sheath or mantle) drawn in one piece. This mantle is dressed close to the steel T. The lead wings, which are rubbed down on to the glass, were sprung from the centre lead core below the

top of the glass to avoid breaking away when worked on and off the glass. The section thus produced is substantially that used to-day.

After Patent Glazing had been in existence about 20 to 25 years, practical experience of the earlier bars showed that there was room for improvement in certain details. Profiting by the experience, we introduced at various times the following new features :—

In about 1909 both ends of the bars were sealed, and in 1911 the holes in the bars were bushed, thus completely hermetically sealing the cover.

In 1918 we discarded the use of loose shoes and turned up the bottom end of the steel bar to act as glass stop, the turned-up end being lead-clothed and sealed. Before being clothed the steel is coated with a " non-rusting " solution.

In 1920 we re-introduced the " Reversed " type with the improvements mentioned above.

The distinctive features of the " Challenge " bar of to-day may be summarised as follows :—

(*a*) All the steel is below the glass level, and thus, even if the lead above is damaged or pierced by any external cause, the seal remains unbroken and the steel protected.

(*b*) The glass stop is an integral part of the bar.

(*c*) The fixing brackets are made from a weather-proof hardened lead alloy, the bars being fixed to them with stout copper cotter pins. These brackets also secure the draught fillet without nailing or screwing.

Thus do we substantiate our claim as the Manufacturers of THE Roof Glazing.

GENERAL INFORMATION.

WEIGHT.

The average weight of "Challenge" Glazing with $\frac{1}{4}$-in. glass is 5 lbs. per sq. ft.

SPACING OF BARS AND WIDTH OF GLASS.

The standard width of glass for Patent Glazing is 24 inches.

The "Challenge" Section bars are placed at centres of 2 ft. $0\frac{1}{4}$ in., and "Challenge Reversed" Section at 2 ft. $0\frac{1}{2}$ in. which allow for squares of glass 24 inches wide. The cost of glazing is increased by placing the bars closer. Sheet glass should not be more than 20 inches wide. Lapped glass is not recommended.

PITCH.

A pitch of at least 30° is advisable in order to prevent snow, &c., lying. Unless specially requested we arrange all our roofs to this slope.

GLASS.

The glass usually used is $\frac{1}{4}$-in. Rough Cast (R.C.) or Hartley's (P.R.P.)

Other glasses are as follows:—

	Obtainable up to ft. in.		Obtainable up to ft. in.
$\frac{1}{4}$-in. R.C. - - -	11 0	$\frac{1}{4}$-in. Rolled Sheet - -	10 0
$\frac{3}{16}$-in. „ - - -	11 0	$\frac{3}{16}$-in „ „ - -	10 0
$\frac{1}{4}$-in. „ (Wired) -	11 0	$\frac{1}{4}$-in. Polished Plate -	11 0
$\frac{1}{4}$-in. P.R.P. (Hartley's) -	11 0	$\frac{1}{4}$-in. „ „ (Wired)	10 0
$\frac{3}{16}$-in. „ „ -	11 0	26-oz. Clear Sheet - -	5 6
$\frac{1}{4}$-in. Double White Rolled	10 0	32-oz. „ „ - -	5 0
$\frac{3}{16}$-in. „ „ „	10 0	36-oz. „ „ - -	4 6

(*NOTE.—26-oz. = $\frac{1}{8}$-in. thickness.*)

Tinted glass for roofs is usually made in $\frac{1}{4}$-in. Rolled Cathedral. All the above can be obscured.

FLASHINGS.

Lead flashings are necessary in nearly all cases at the top of the glazing, and usually at the bottom and ends. 4-lb. or 5-lb. lead is mostly used.

VENTILATORS.

These should be placed at THE TOP of the glazing to enable them to be properly flashed.

BENT WORK.

All the bars shown can be bent for use with bent glass.

STOCK SIZES of GLAZING BARS.

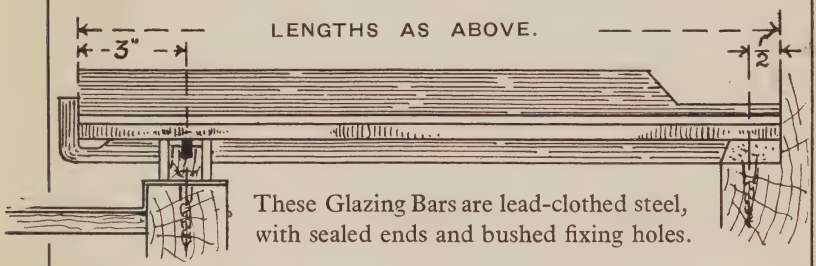
In order to assist Builders to carry out URGENT jobs, we now carry a STOCK OF GLAZING BARS.

Town orders can be supplied WITHOUT DELAY and rail orders despatched on the day order is received.

Section AR—Lengths in Stock, 3′ 0″, 3′ 6″, 4′ 0″, 4′ 6″, 5′ 0″, 5′ 6″, 6′ 0″, 6′ 6″.

Section BR—Lengths in Stock, 7′ 0″, 7′ 6″, 8′ 0″.

End bars are stocked to suit these lengths.



These Glazing Bars are lead-clothed steel, with sealed ends and bushed fixing holes.

The bottom ends are turned up and lead-clothed and act as glass stops.

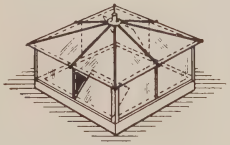
Bottom brackets, draught fillets and gunmetal screws are supplied with the bars.

GLASS.—Glass most commonly used is rough cast $\frac{1}{4}$″ thick, standard width being 24″. Thinner glass can be used—21 oz. should not be more than 18″ wide. Use glass in one length, do not use lapped glass. Allow $\frac{1}{2}$″ for thickness of Sections AR and BR, and $\frac{3}{8}$″ for end bars. Do not allow more. It is important that glass perfectly flat both sides should be used.

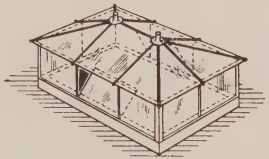
FIXING, &c.—Press wings straight up against stem of bar: see that lead seatings for glass are true, if not, straighten. Screw bottom fixing bracket to bar with gunmetal set screw. Secure bar to timbers by screwing through holes in bracket, making sure that the bar is square off timbers. Drop in draught fillets between holders in brackets. Lay in glass, bedding top edge as shown. Dress lead wings on to glass, using a short, stout wood lath with end cut wedge shape

CHALLENGE STANDARD LANTERN SKYLIGHTS.

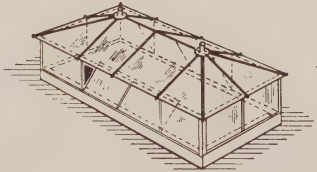
TYPE SLB



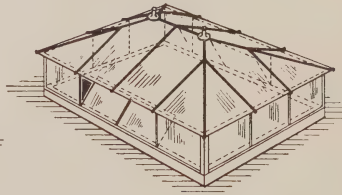
4'-0" × 4'-0" [SLB.44]



6'-0" × 4'-0" [SLB.64]

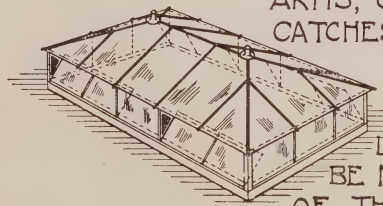


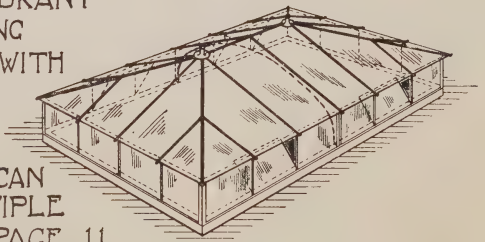
8'-0" × 4'-0" [SLB.84]



8'-0" × 6'-0" [SLB.86]

BOTTOM HUNG SASHES REPEATED ON OPPOSITE SIDES & FITTED WITH FOLDING ROLLER QUADRANT ARMS, COMBINED SPRING RING CATCHES & PULLEYS FOR USE WITH CORDS OR LONG ARM.





LANTERN SKYLIGHTS CAN BE MADE UP TO ANY MULTIPLE OF THESE FRAMES, SEE PAGE 11. OF SPECIAL LIST.

10'-0" × 6'-0" [SLB.106]

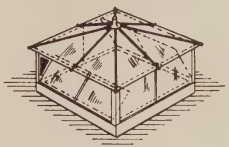
12'-0" × 8'-0" [SLB.128]

THESE LANTERN SKYLIGHTS ARE FITTED WITH OUR PATENT LEAD CLOTHED RIDGE, HIPS & GLAZING BARS.

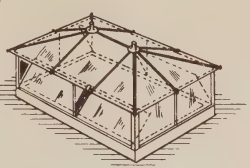
For prices and further information see separate list.

CHALLENGE STANDARD LANTERN SKYLIGHTS.

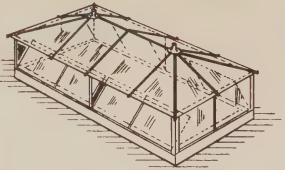
TYPE SLB. XV.



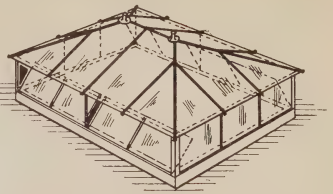
4'-0" × 4'-0"
[SLB. 44 XV.]



6'-0" × 4'-0"
[SLB. 64 XV.]

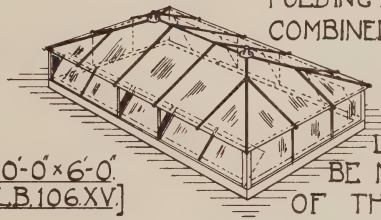


8'-0" × 4'-0"
[SLB. 84 XV.]



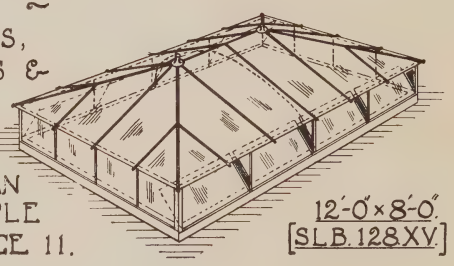
8'-0" × 6'-0"
[SLB. 86 XV]

BOTTOM HUNG SASHES REPEATED ON OPPOSITE SIDES & FITTED WITH ~ FOLDING. ROLLER QUADRANT ARMS, COMBINED SPRING RING CATCHES & PULLEYS FOR USE WITH CORDS OR LONG ARM.



10'-0" × 6'-0"
[SLB. 106 XV.]

LANTERN SKYLIGHTS CAN BE MADE UP TO ANY MULTIPLE OF THESE FRAMES, SEE PAGE 11. OF SPECIAL LIST.

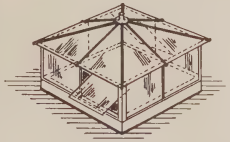


12'-0" × 8'-0"
[SLB. 128 XV.]

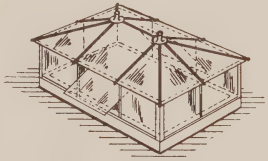
THESE LANTERN SKYLIGHTS ARE FITTED WITH OUR PATENT LEAD CLOTHED RIDGE, HIPS & GLAZING BARS.

~CHALLENGE STANDARD LANTERN SKYLIGHTS.~

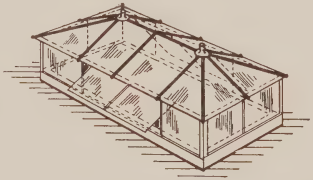
TYPE SLC.



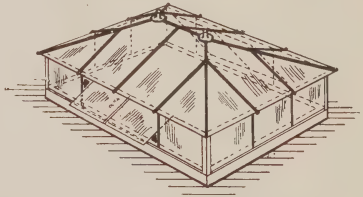
4'-0"×4'-0"[SLC.44]



6'-0"×4'-0"[SLC64]

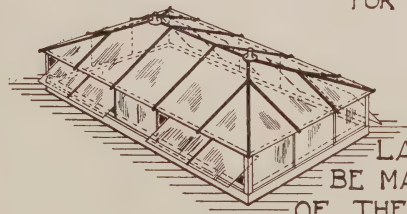


8'-0"×4'-0"[SLC.84]



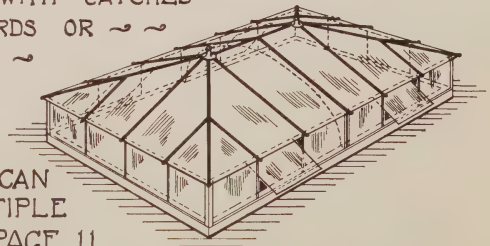
8'-0"×6'-0"[SLC.86]

HORIZONTAL CENTRE HUNG SASHES REPEATED ON OPPOSITE SIDES & FITTED WITH CATCHES FOR OPERATING WITH CORDS OR ~ ~ LONG ARM ~ ~ ~



10'-0"×6'-0"[SLC.106]

LANTERN SKYLIGHTS CAN BE MADE UP TO ANY MULTIPLE OF THESE FRAMES, SEE PAGE 11. OF SPECIAL LIST.

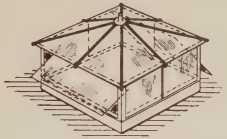


12'-0"×8'-0"[SLC.128]

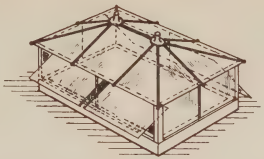
THESE LANTERN SKYLIGHTS ARE FITTED WITH OUR PATENT LEAD CLOTHED RIDGE HIPS & GLAZING BARS.

~CHALLENGE STANDARD LANTERN SKYLIGHTS.~

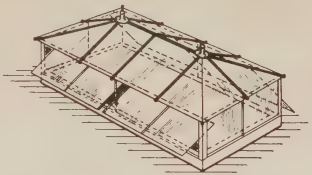
TYPE SLC. XV.



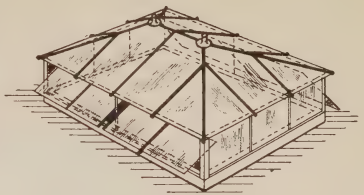
4'-0"×4'-0" [SLC.44XV]



6'-0"×4'-0" [SLC.64XV]

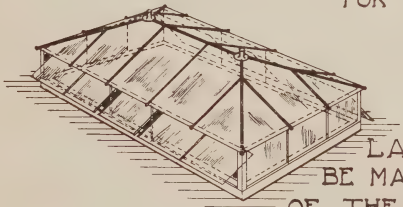


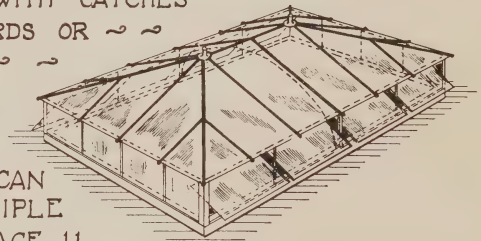
8'-0"×4'-0" [SLC.84XV]



8'-0"×6'-0" [SLC.86.XV]

HORIZONTAL CENTRE HUNG SASHES REPEATED ON OPPOSITE SIDES & FITTED WITH CATCHES FOR OPERATING WITH CORDS OR ~ ~ LONG ARM. ~ ~ ~





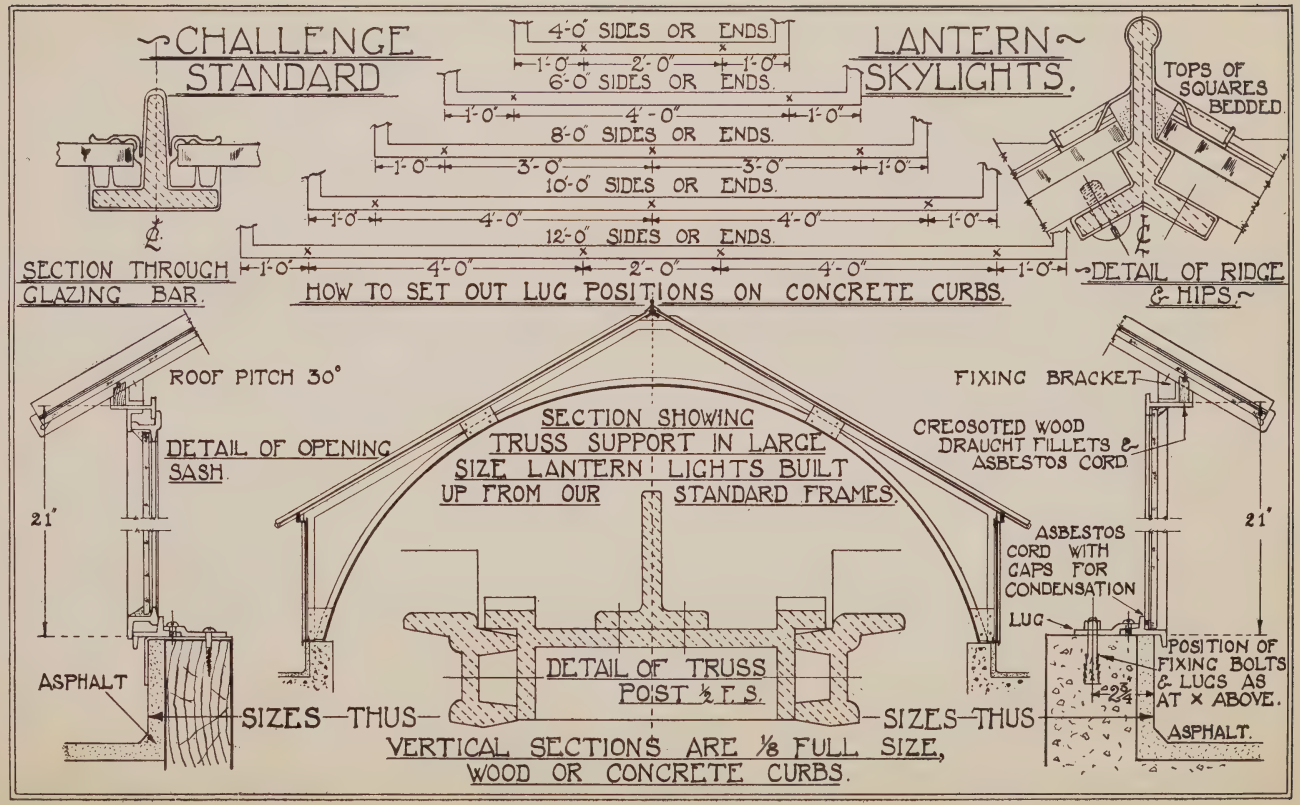
LANTERN SKYLIGHTS CAN BE MADE UP TO ANY MULTIPLE OF THESE FRAMES, SEE PAGE 11. OF SPECIAL LIST.

10'-0"×6'-0" [SLC.106XV]

12'-0"×8'-0" [SLC.128XV]

THESE LANTERN SKYLIGHTS ARE FITTED WITH OUR PATENT LEAD CLOTHED RIDGE HIPS & GLAZING BARS.

For prices and further information see separate list.


CHALLENGE STANDARD
LANTERN SKYLIGHTS.
4'-0" SIDES OR ENDS.
1'-0" 2'-0" 1'-0"
6'-0" SIDES OR ENDS.
1'-0" 4'-0" 1'-0"
8'-0" SIDES OR ENDS.
1'-0" 3'-0" 3'-0" 1'-0"
10'-0" SIDES OR ENDS.
1'-0" 4'-0" 4'-0" 1'-0"
12'-0" SIDES OR ENDS.
1'-0" 4'-0" 2'-0" 4'-0" 1'-0"
TOPS OF SQUARES BEDDED.
SECTION THROUGH GLAZING BAR.
HOW TO SET OUT LUG POSITIONS ON CONCRETE CURBS.
DETAIL OF RIDGE & HIPS.
ROOF PITCH 30°
DETAIL OF OPENING SASH.
21"
ASPHALT
SECTION SHOWING TRUSS SUPPORT IN LARGE SIZE LANTERN LIGHTS BUILT UP FROM OUR STANDARD FRAMES.
DETAIL OF TRUSS POST ½ F.S.
SIZES—THUS—
SIZES—THUS
FIXING BRACKET
CREOSOTED WOOD DRAUGHT FILLETS & ASBESTOS CORD
ASBESTOS CORD WITH CAPS FOR CONDENSATION
LUG
21"
POSITION OF FIXING BOLTS & LUGS AS AT × ABOVE.
2¾"
ASPHALT.
VERTICAL SECTIONS ARE ⅛ FULL SIZE, WOOD OR CONCRETE CURBS.

CHALLENGE STANDARD LANTERN SKYLIGHTS.

VARIATIONS AND LARGER SIZES.

The vertical sides and ends are made as complete frames.

Normally the opening sashes are supplied in the sides only, the ends being fixed.

Sides and ends can be interchanged, so that any size can be supplied without any opening sashes, and conversely sashes can be supplied in both sides and ends. (Opening sashes are not workable immediately adjoining the corners of *both* sides *and* ends.)

Larger sizes can be supplied by connecting up any of the side and end units with connecting posts, e.g. an 18′ 0″ × 6′ 0″ (S.L.186) would be made up with three 6′ 0″ side frames and ordinary 6′ 0″ ends.

SPECIFICATION.

Vertical sides in heavy wrought iron sections with cast iron corner posts and with cast iron connecting posts where necessary.

Opening sashes bottom hung or horizontal centre hung with double check weathering sections and fitted with heavy combined spring ring catch for opening with Customers' cord or long arm.

Patent lead clothed glazing bars and hips and ridges with all fittings in hardened lead, with malleable iron finials and lead caps, and all draught fillets.

All screws and bolts.

Glass cut to shape.

Where necessary light steel trusses in the larger lantern skylights, the connecting posts then acting as truss posts also.

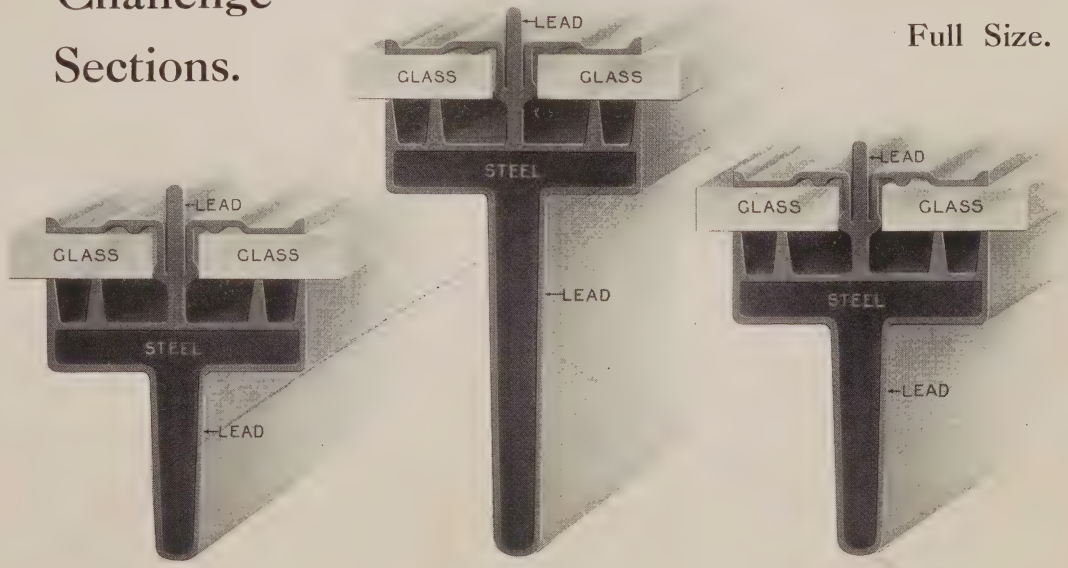
All exposed metal painted one coat before delivery.

For rail deliveries the roof bars and hips and ridges and glass are packed in cases (cases to be paid for against invoice and refunded upon cases being returned to our Works in good condition.) Straw and packing must be removed from crates and cases before returning. The vertical frames are bundled.

(*Note.—Lantern Skylights should be distinguished from other forms of skylights by the use of vertical sides and ends.*)

"Challenge" Sections.

Full Size.



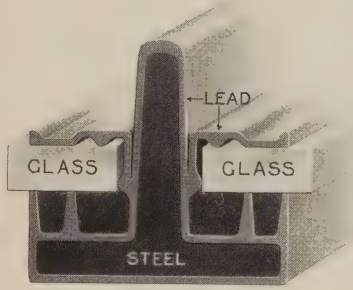
Section A.
Bearing 6′ 6″.

Section C.
Bearing 11′ 0″.

Section B.
Bearing 8′ 6″.

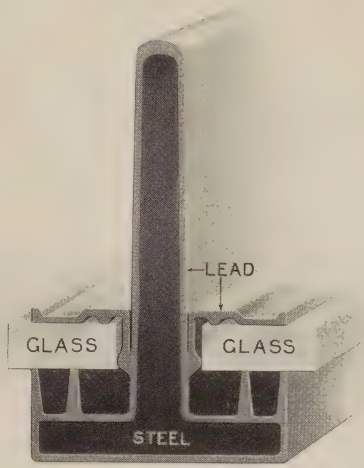
"Challenge Reversed" Sections.

Full Size.



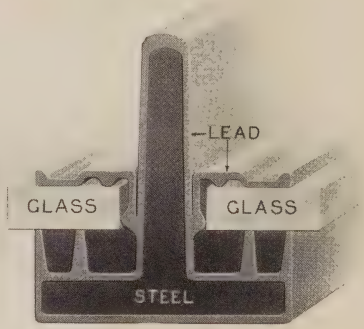
Section A R.

Bearing 6′ 6″.



Section C R.

Bearing 11′ 0″.

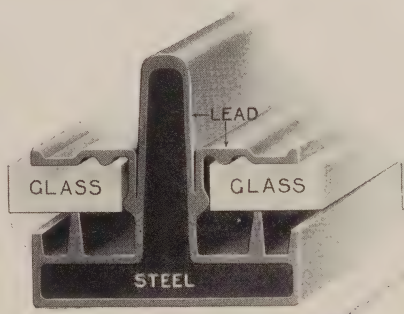


Section B R.

Bearing 8′ 6″.

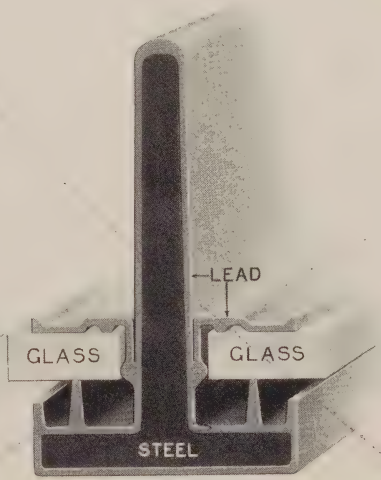
"Challenge Canadian Reversed" Sections.

Full Size.



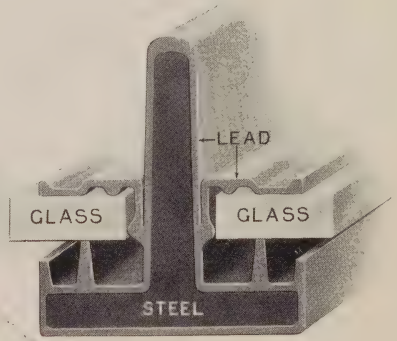
Section A R C.

Bearing 6′ 6″.



Section C R C.

Bearing 11′ 0″.

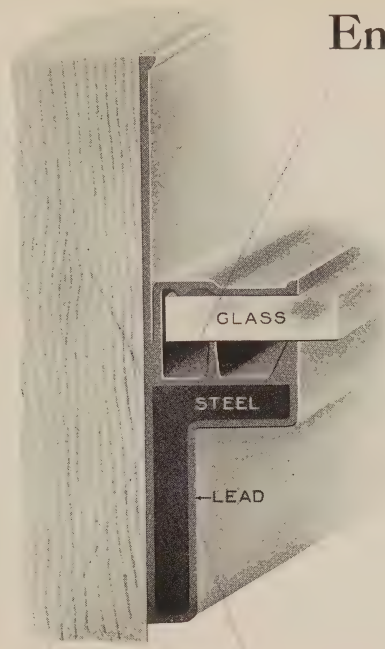


Section B R C.

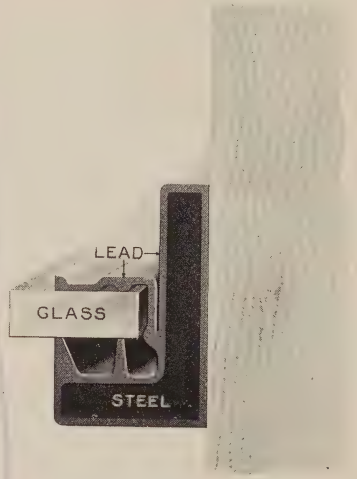
Bearing 8′ 6″.

End Bars.

Full Size.



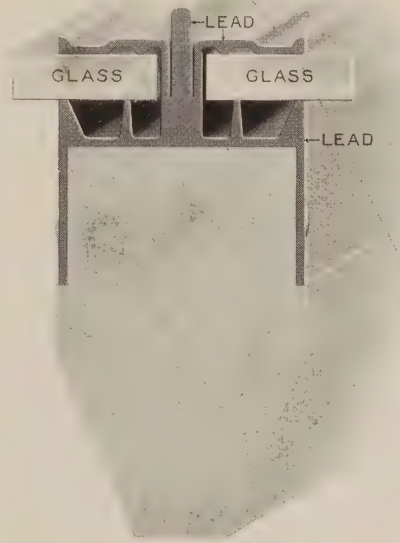
"Challenge" Section.



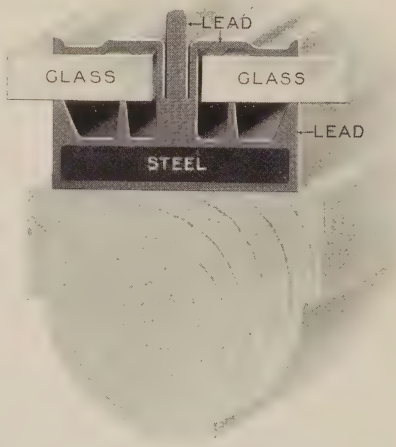
"Challenge" Reversed Section.

"Challenge" Sections.

Full Size.



Section D.

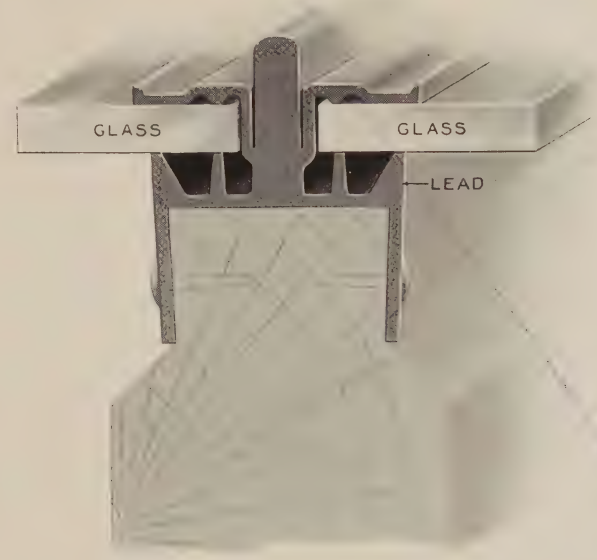


Section F.

Depth and moulding of wood bars as required.

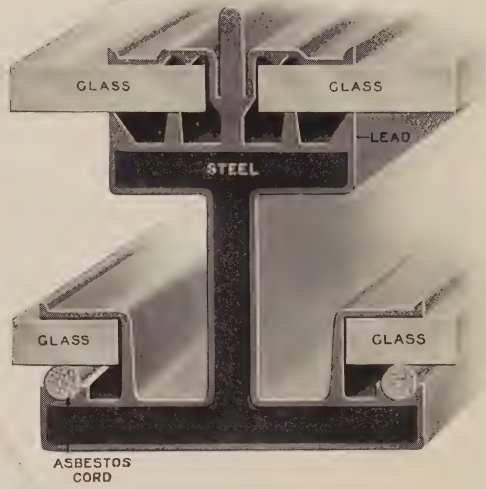
Special Sections.

Full Size.



Railway Section.

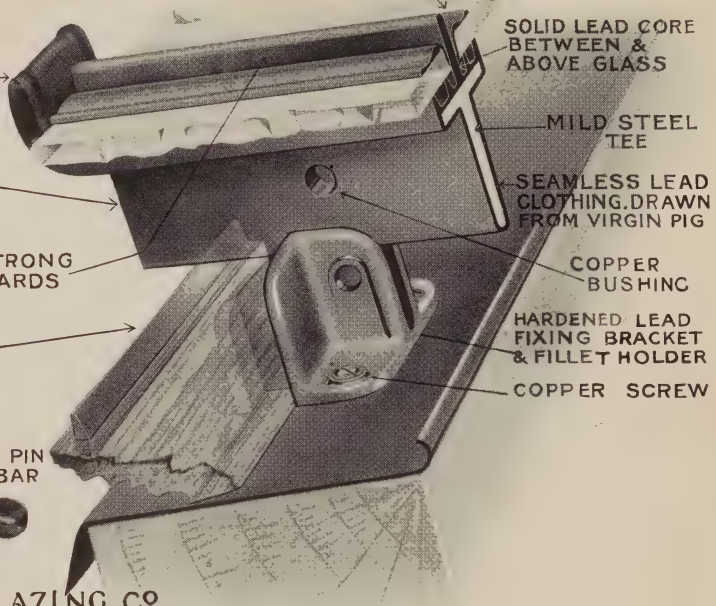
Reg. No. 680,718.



Double Glazing Section.

Reg. Design 720,473.

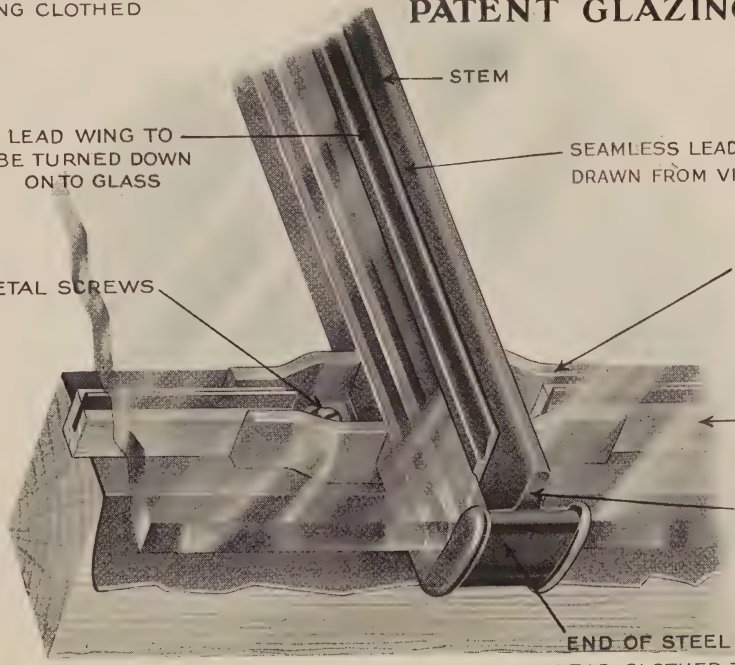
THE CHALLENGE PATENT GLAZING BAR


LEAD WINGS TURNED DOWN ON TO GLASS
STEEL IS TREATED WITH NON RUST SOLUTION BEFORE BEING CLOTHED
SOLID LEAD CORE BETWEEN & ABOVE GLASS
END OF STEEL TEE TURNED UP & LEAD CLOTHED TO ACT AS GLASS STOP
MILD STEEL TEE
ALL ENDS SEALED
SEAMLESS LEAD CLOTHING. DRAWN FROM VIRGIN PIG
LEAD CORE IS SUFFICIENTLY STRONG TO SUPPORT BOARDS
COPPER BUSHING
HARDENED LEAD FIXING BRACKET & FILLET HOLDER
LEAD & CREOSOTED DRAUGHT FILLET
COPPER SCREW
COPPER COTTER PIN FOR SECURING BAR TO BRACKET

THE BRITISH CHALLENGE GLAZING Co
MARSHGATE LANE, STRATFORD. E.15.

CHALLENGE REVERSED
PATENT GLAZING BAR

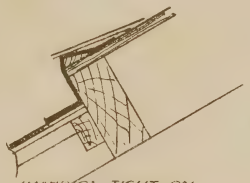
STEEL TEE CORE IS TREATED WITH NON-RUST SOLUTION BEFORE BEING CLOTHED


STEM
LEAD WING TO BE TURNED DOWN ONTO GLASS
SEAMLESS LEAD CLOTHING DRAWN FROM VIRGIN PIG
GUNMETAL SCREWS
HARDENED LEAD FIXING BRACKET & FILLET HOLDER
LEAD & CREOSOTED DRAUGHT FILLET
ALL ENDS SEALED & ALL HOLES COPPER BUSHED
END OF STEEL TEE TURNED UP & LEAD CLOTHED TO ACT AS GLASS STOP

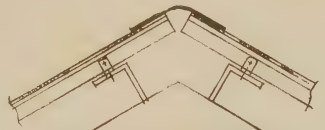
PART II.

STANDARD DETAILS.

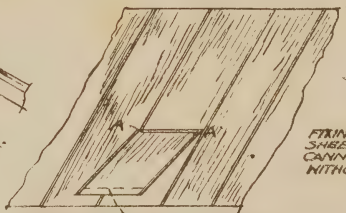
* WHAT TO AVOID * * AND WHY *



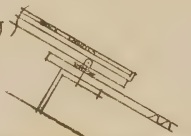
FLASHINGS TIGHT ON TO GLASS - INDUCES LEAKAGES BY CAPILLARY ATTRACTION.



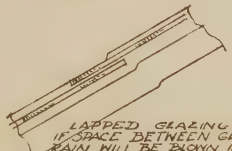
TWO ANGLES NEAR APEX. NO SUPPORT PROVIDED FOR RIDGE FLASHINGS — —



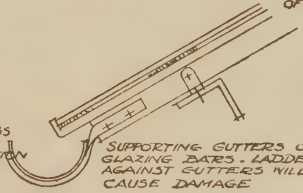
VENTILATORS AT FOOT - DIFFICULTY OF MAKING SOUND JOINT AT A



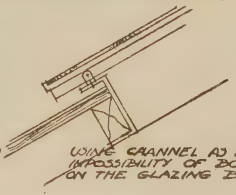
FIXING ON TO CORRUGATED SHEETING - SHEETING CANNOT BE REPLACED WITHOUT STRIPPING THE GLAZING.



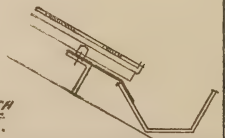
LAPPED GLAZING IF SPACE BETWEEN GLASS RAIN WILL BE BLOWN IN. IF NO SPACE CONDENSATION WILL FALL INSIDE.



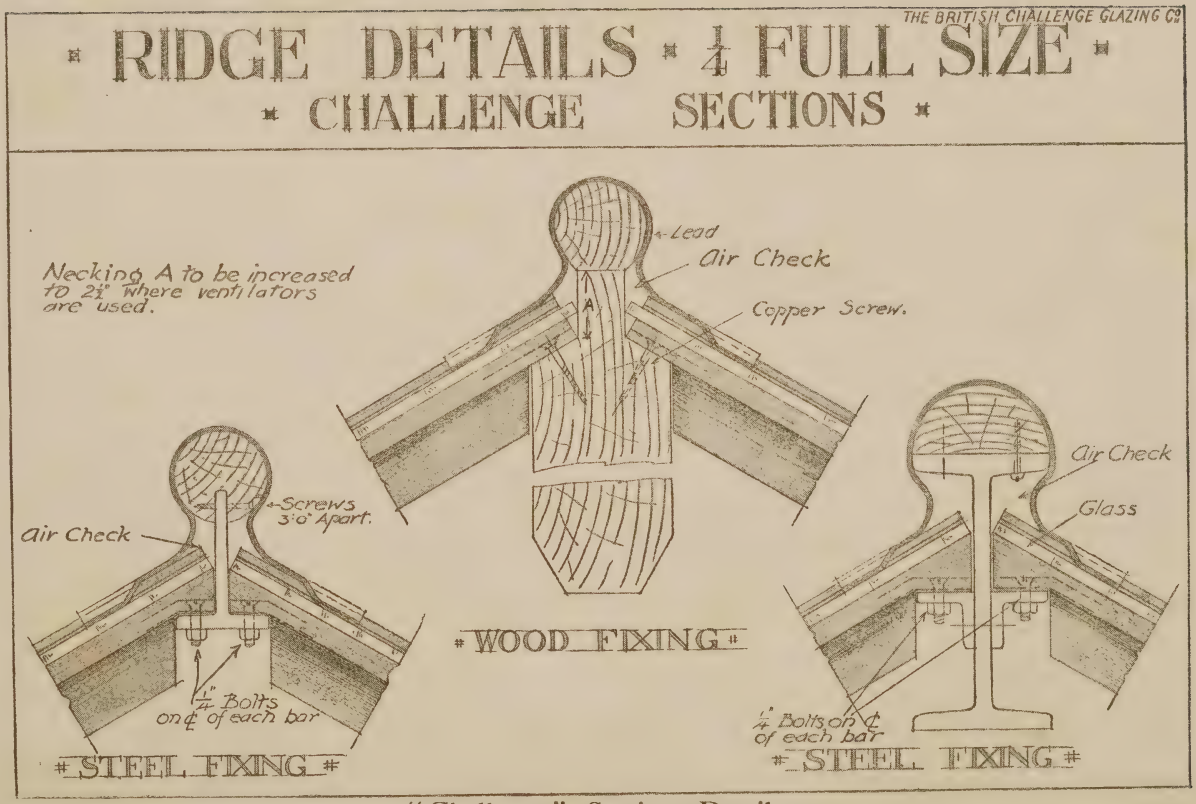
SUPPORTING GUTTERS ON GLAZING BARS - LADDERS AGAINST GUTTERS WILL CAUSE DAMAGE



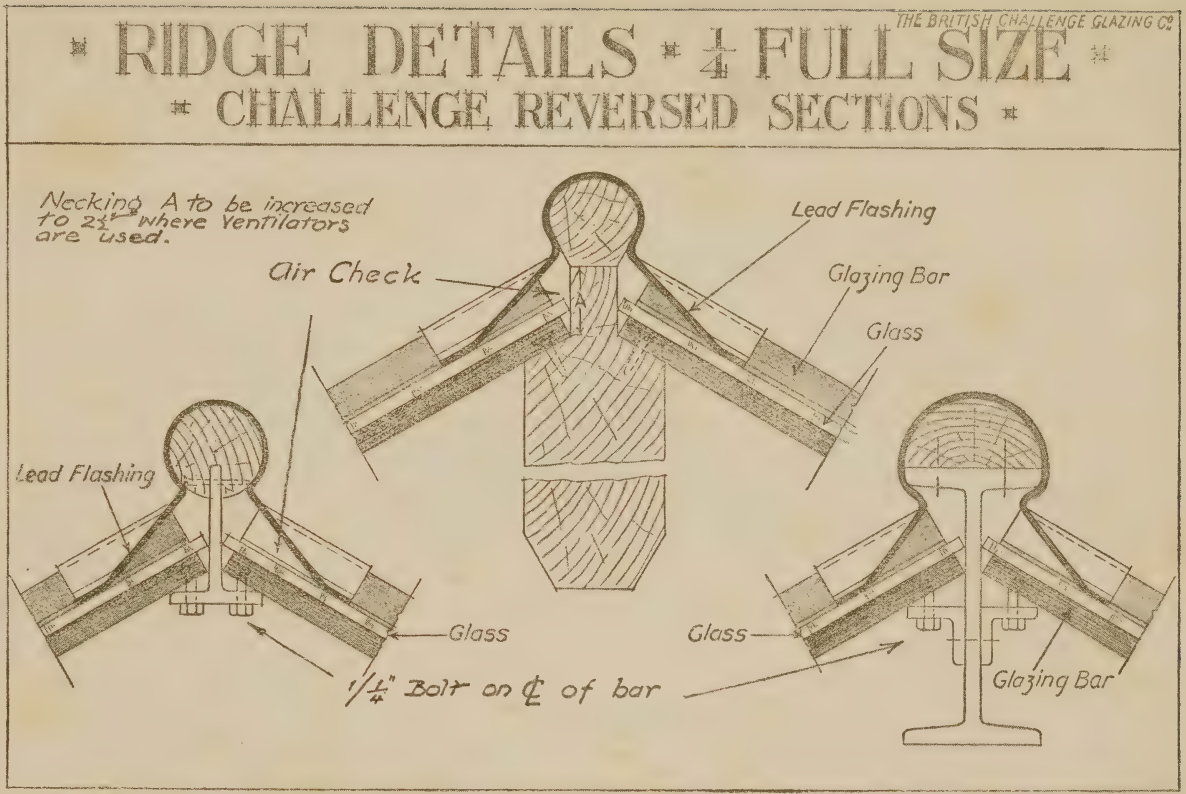
USING CHANNEL AS SKETCH IMPOSSIBILITY OF BOLTING ON THE GLAZING BARS.



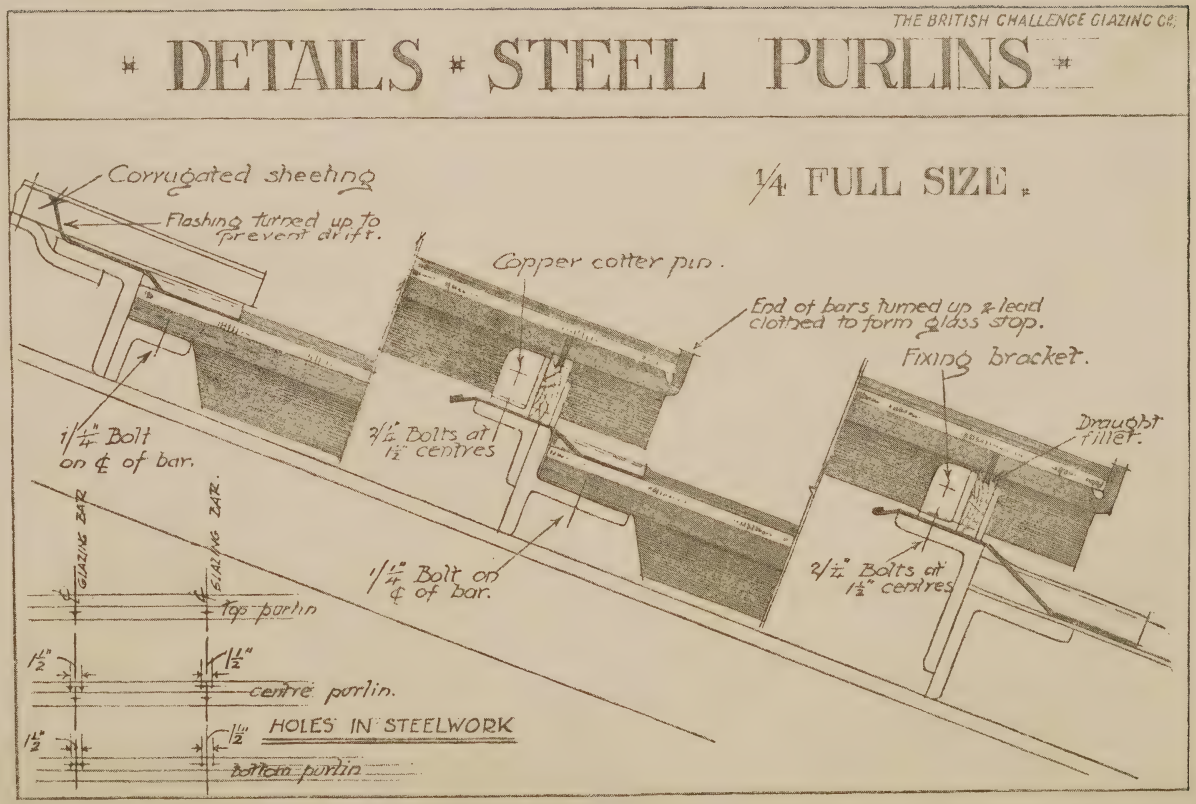
WIDE GAP BETWEEN PURLIN & GUTTER - NO SUPPORT FOR FLASHING. TO OMIT FLASHING IS TO COURT DISASTER.



"Challenge" Section Details.



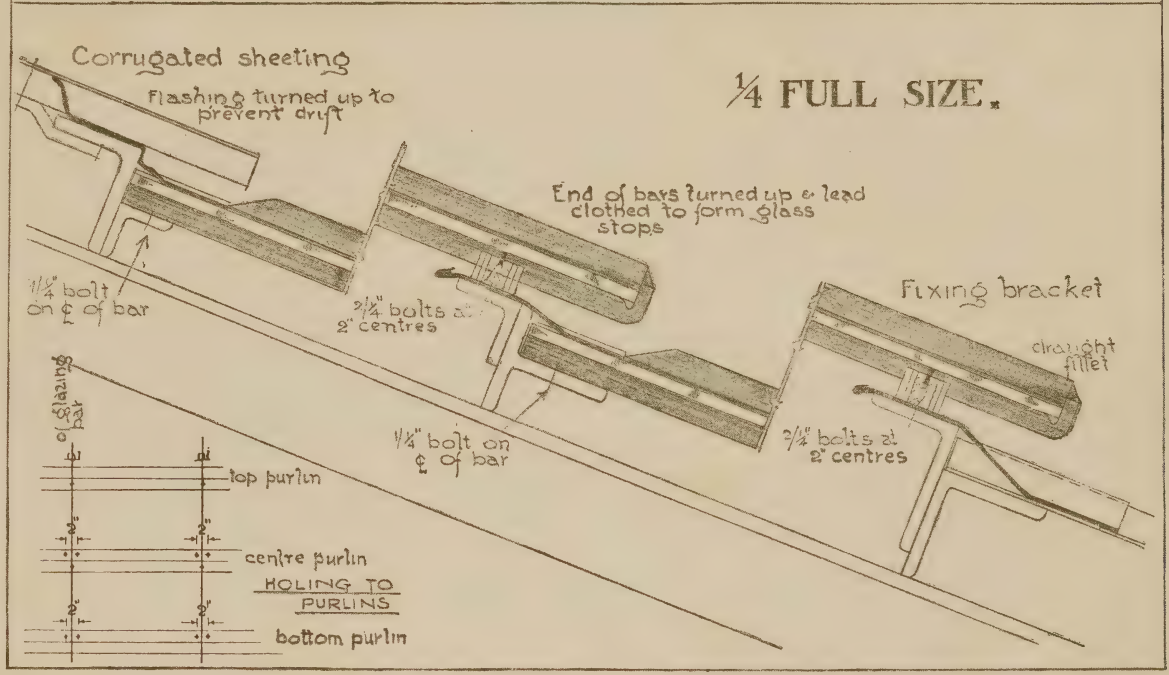
"Challenge" Reversed Section Details.



"Challenge" Section Details.

THE BRITISH CHALLENGE GLAZING Co.

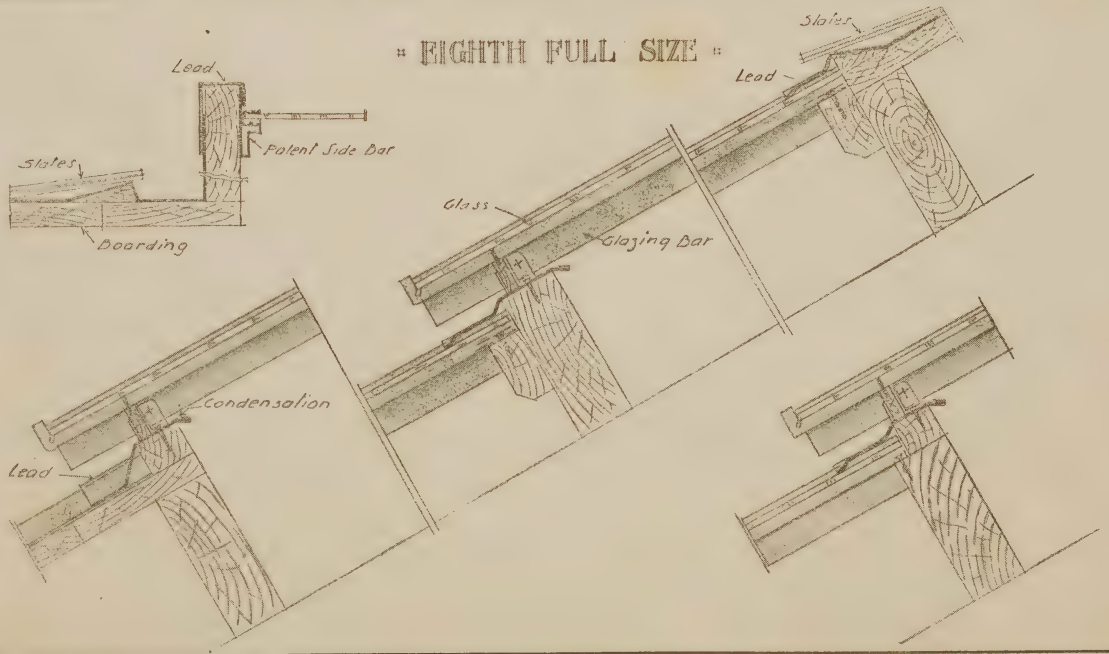
* DETAILS * STEEL * PURLINS *


Corrugated sheeting
Flashing turned up to prevent drift
¼ FULL SIZE.
End of bars turned up & lead clothed to form glass stops
Fixing bracket
draught fillet
1¼" bolt on ℄ of bar
2¼" bolts at 2" centres
2¼" bolts at 2" centres
1¼" bolt on ℄ of bar
℄ of Glazing bar
top purlin
centre purlin
HOLING TO PURLINS
bottom purlin

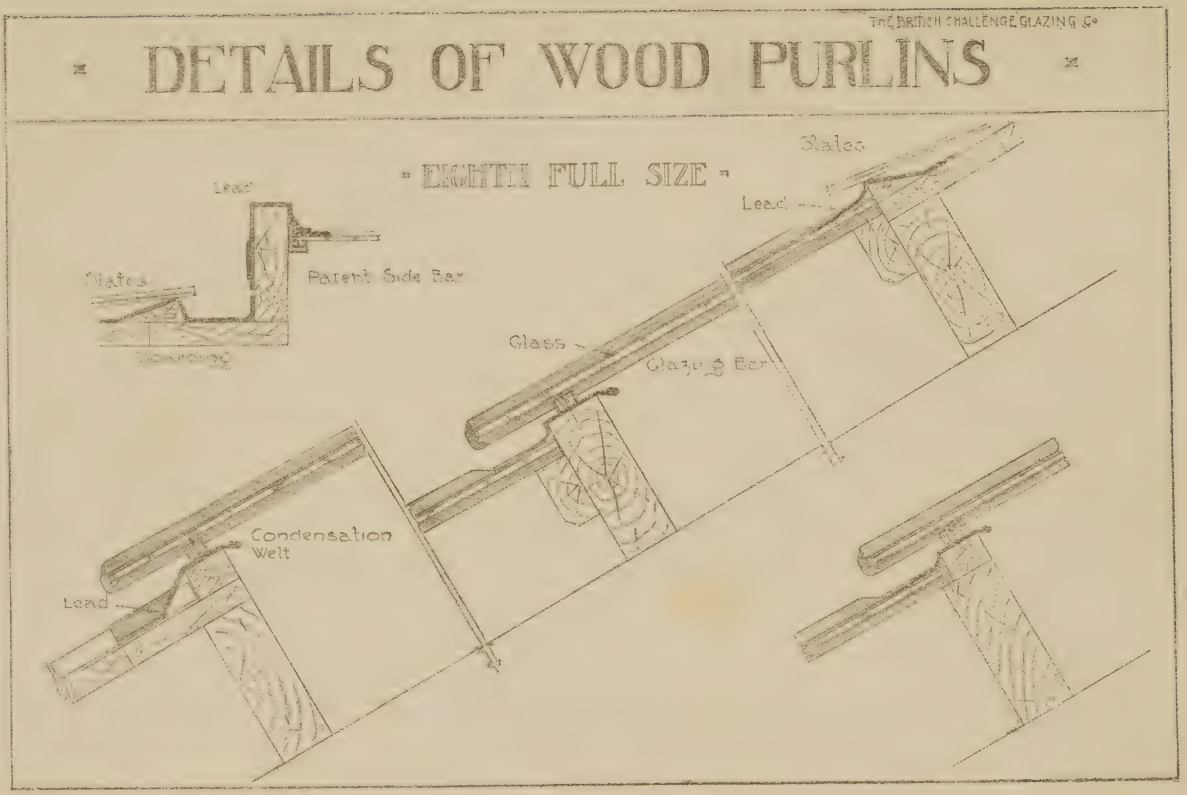
"Challenge" Reversed Section Details.

DETAILS OF WOOD PURLINS

EIGHTH FULL SIZE



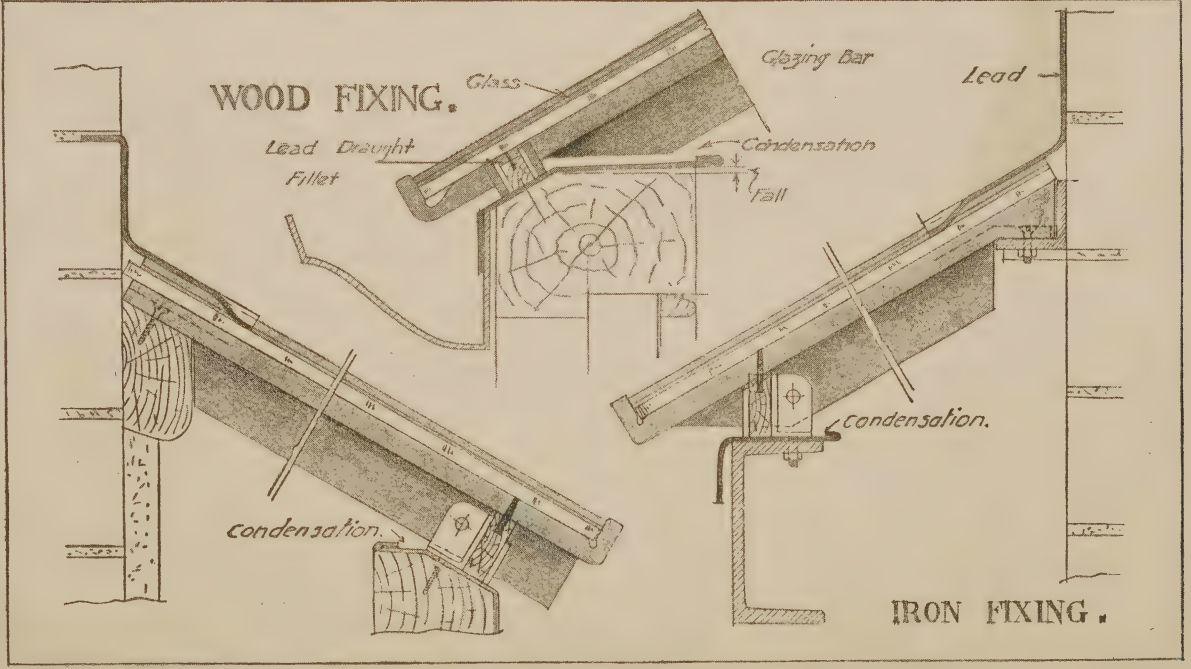
"Challenge" Section Details.



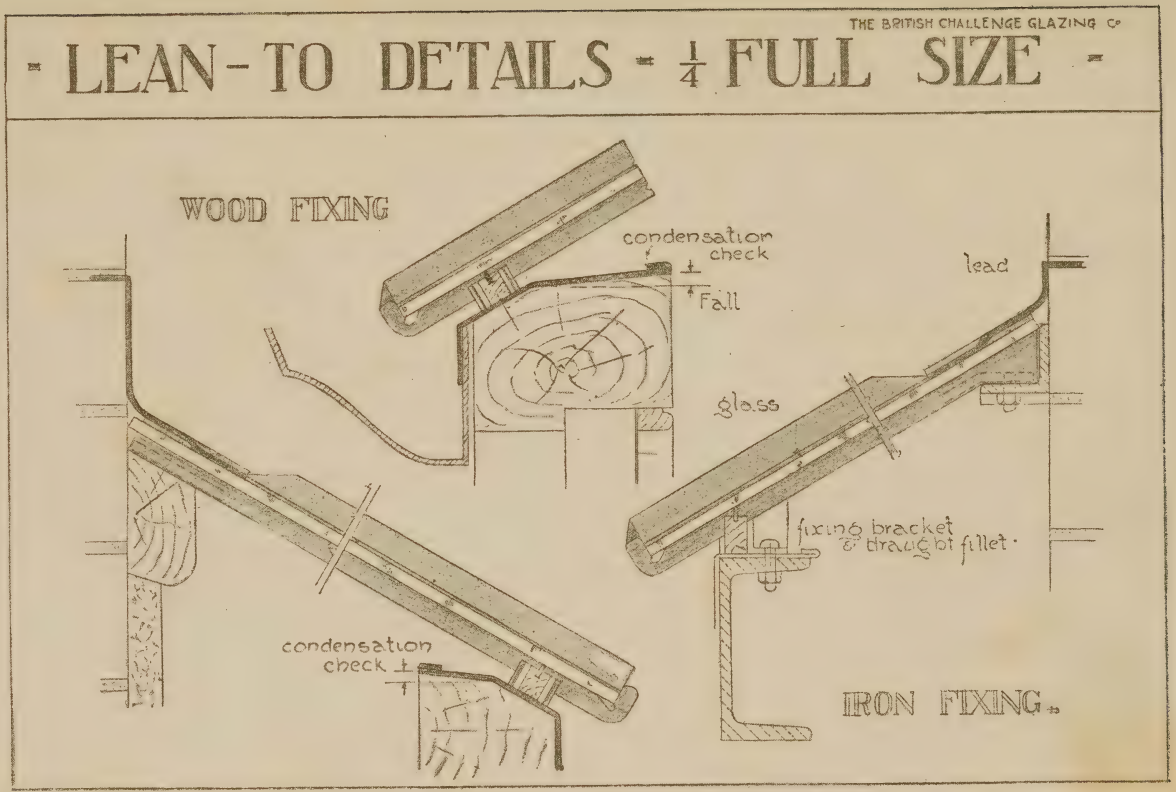
"Challenge" Reversed Section Details.

THE BRITISH CHALLENGE GLAZING Co

LEAN-TO DETAILS ¼ FULL SIZE



"Challenge" Section Details.



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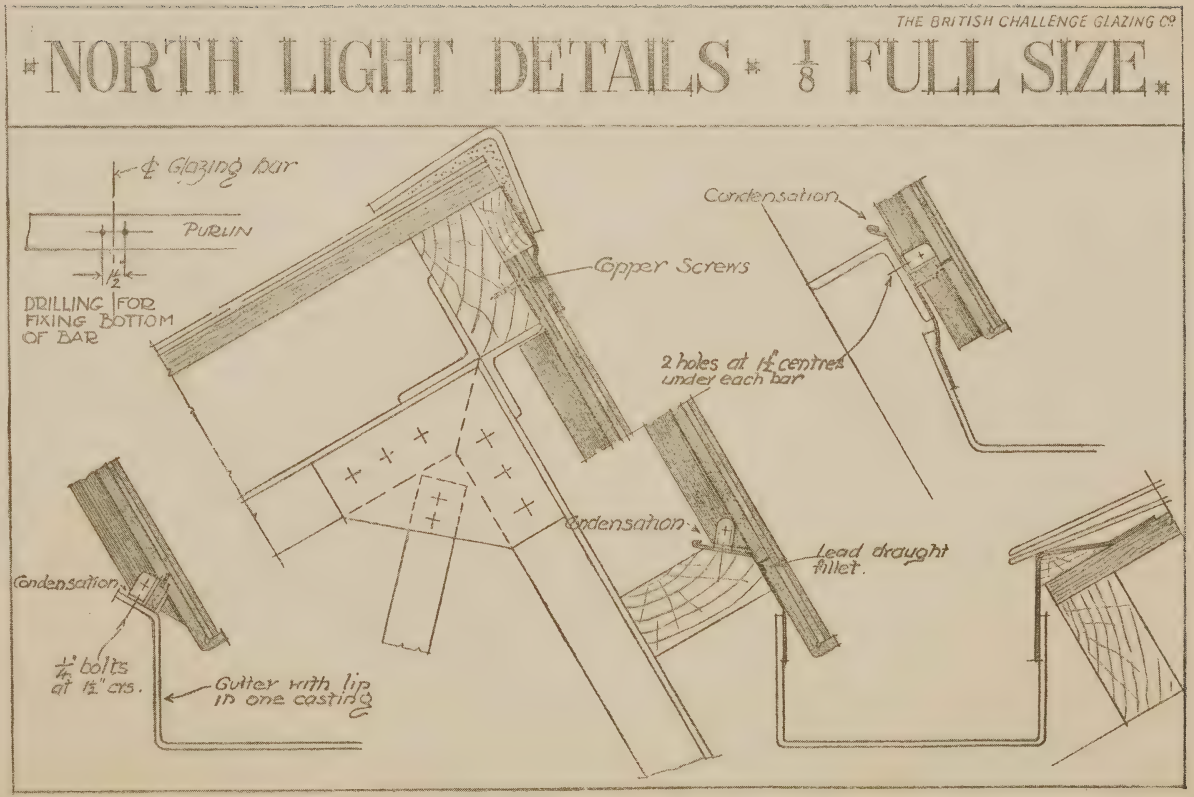
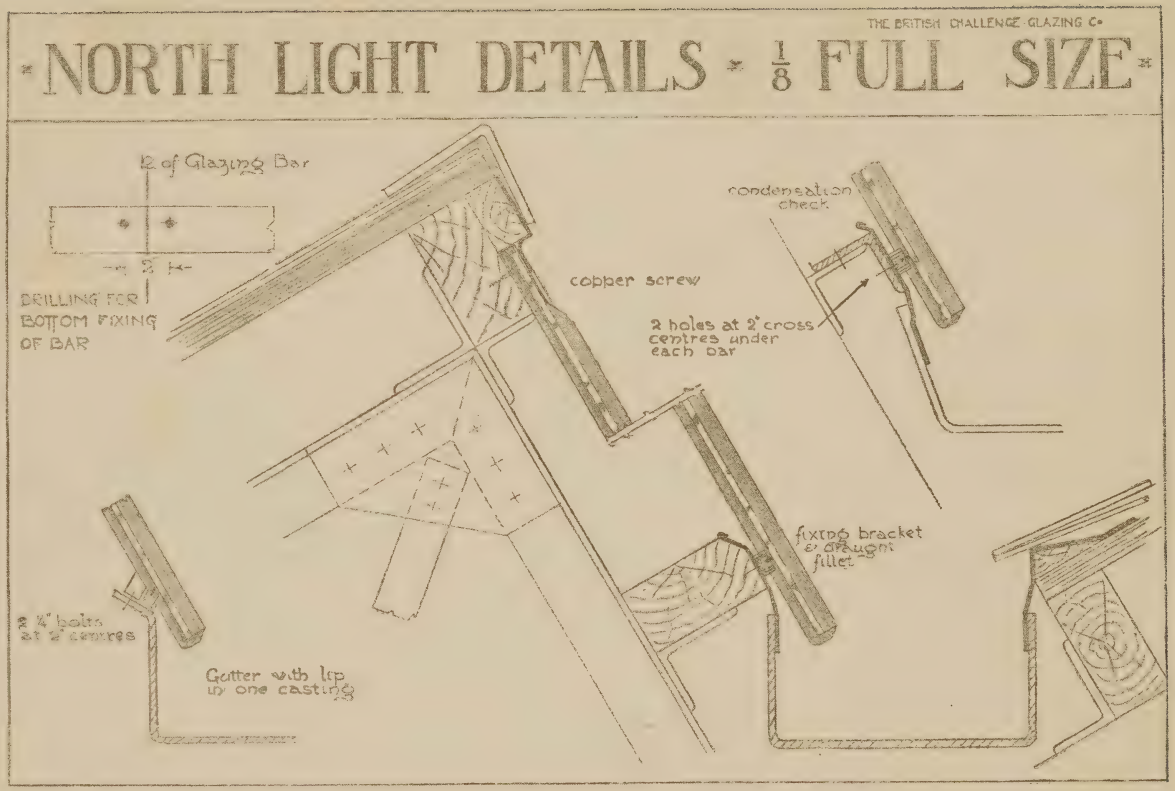
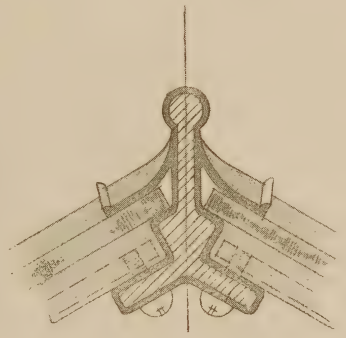


"Challenge" Section Details.


THE BRITISH CHALLENGE GLAZING Co.
NORTH LIGHT DETAILS - 1/8 FULL SIZE
½ of Glazing Bar
DRILLING FOR BOTTOM FIXING OF BAR
condensation check
copper screw
2 holes at 2" cross centres under each bar
fixing bracket & draught fillet
2 ¼" bolts at 2' centres
Gutter with lip in one casting

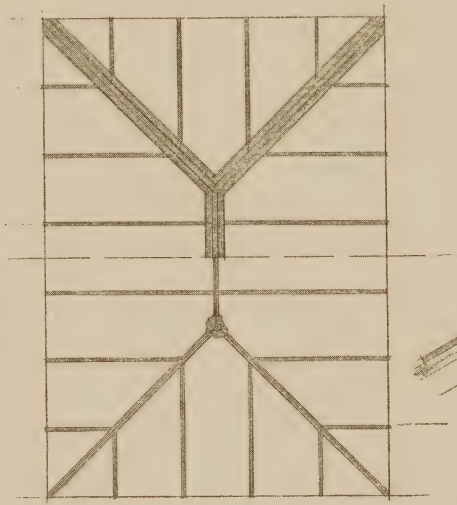
"Challenge" Reversed Section Details.

PATENT LEAD CLOTHED RIDGE & HIPS

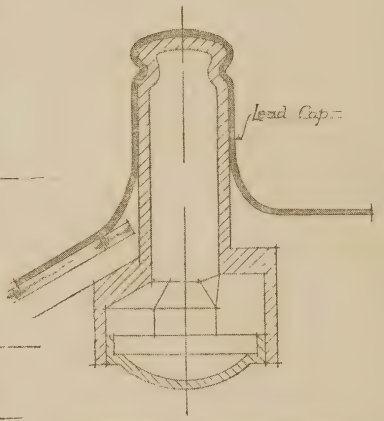


½ FULL SIZE

Registered Design No. 705352.



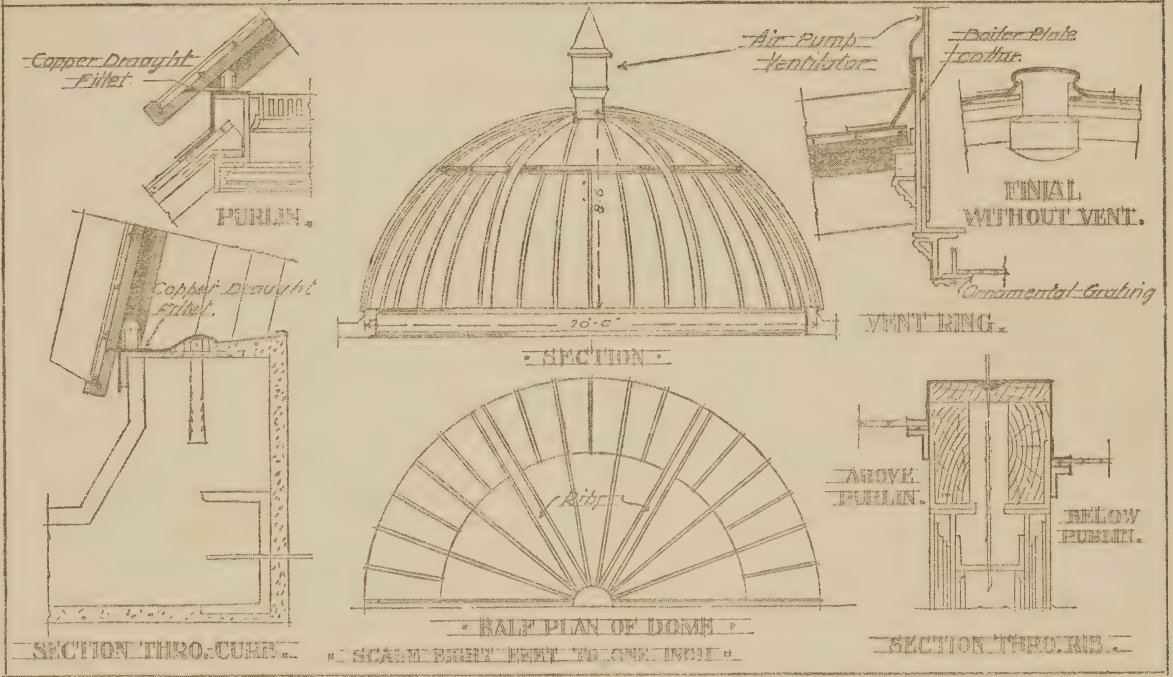
PLAN SHOWING COMPARISON WITH FLASHINGS OVER ROLL



FINIAL ½ FULL SIZE

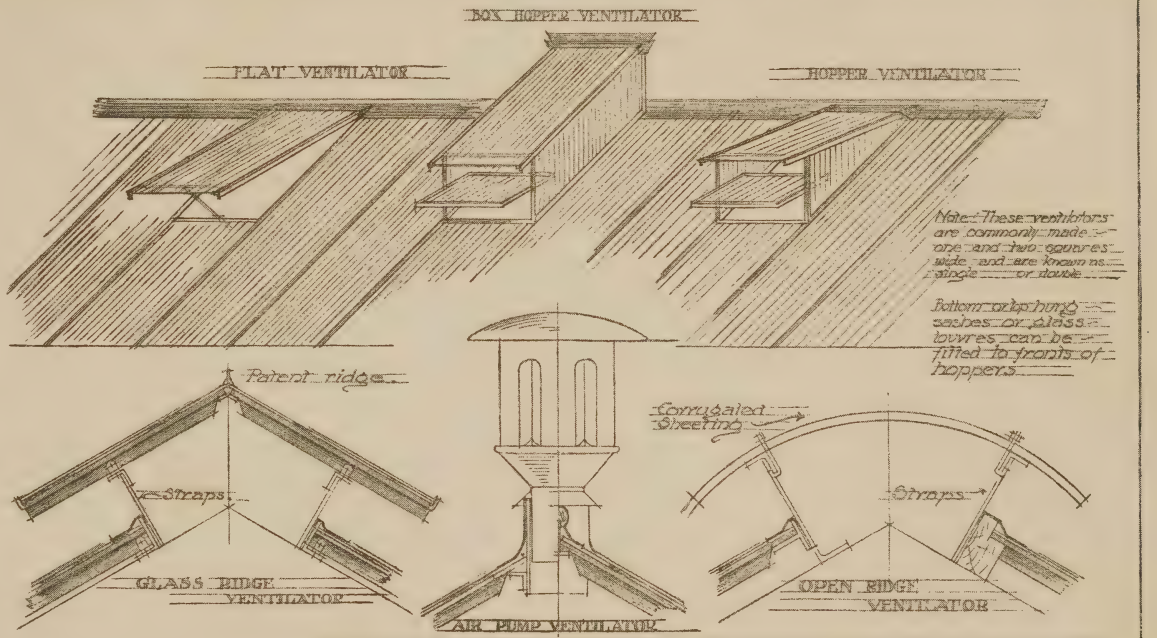
THE BRITISH CHALLENGE GLAZING Co.

DOME DETAILS EIGHTH FULL SIZE



THE BRITISH CHALLENGE GLAZING Co

* VENTILATORS *


BOX HOPPER VENTILATOR
FLAT VENTILATOR
HOPPER VENTILATOR
Note:- These ventilators are commonly made one and two squares wide and are known as single or double
Bottom opening sashes or glass louvres can be fitted to fronts of hoppers
Patent ridge
Straps
GLASS RIDGE VENTILATOR
AIR PUMP VENTILATOR
Corrugated Sheeting
Straps
OPEN RIDGE VENTILATOR

PART III.

ILLUSTRATIONS

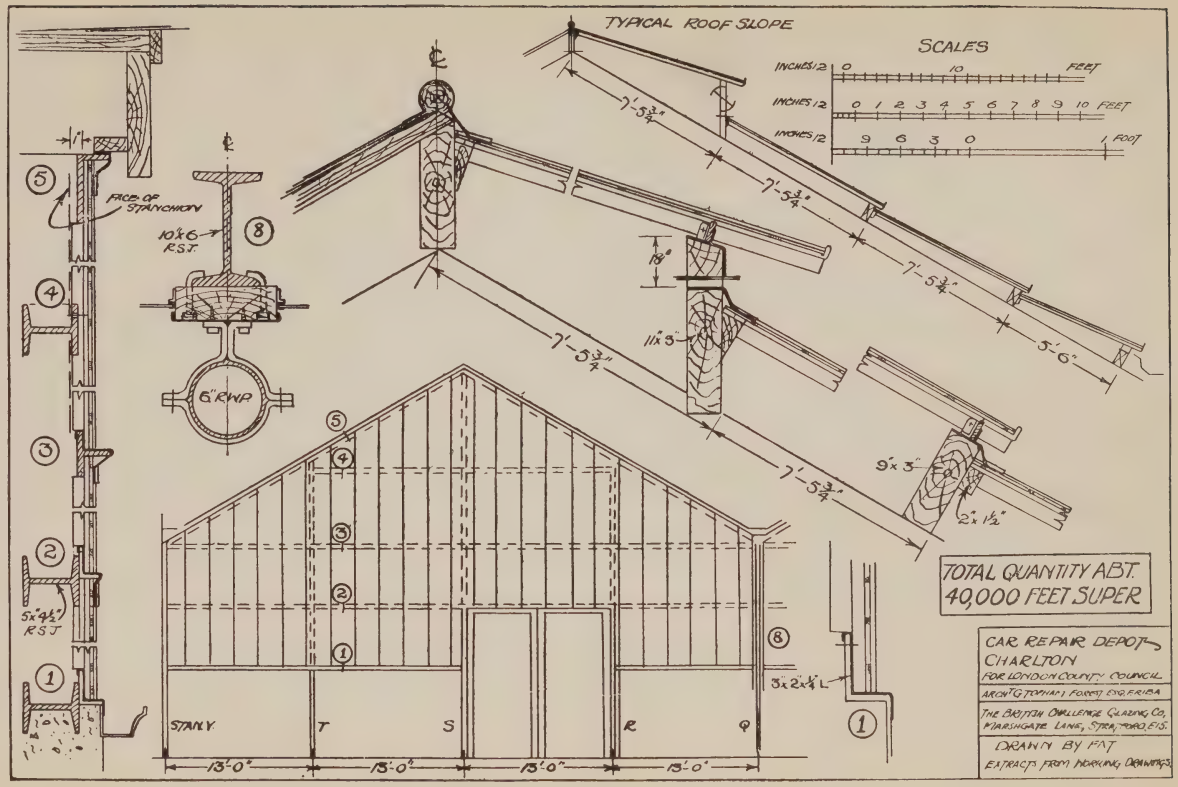
and

WORKING DRAWINGS.

Royal Institute of British Architects.
Main Lantern Light over New Meeting Room.

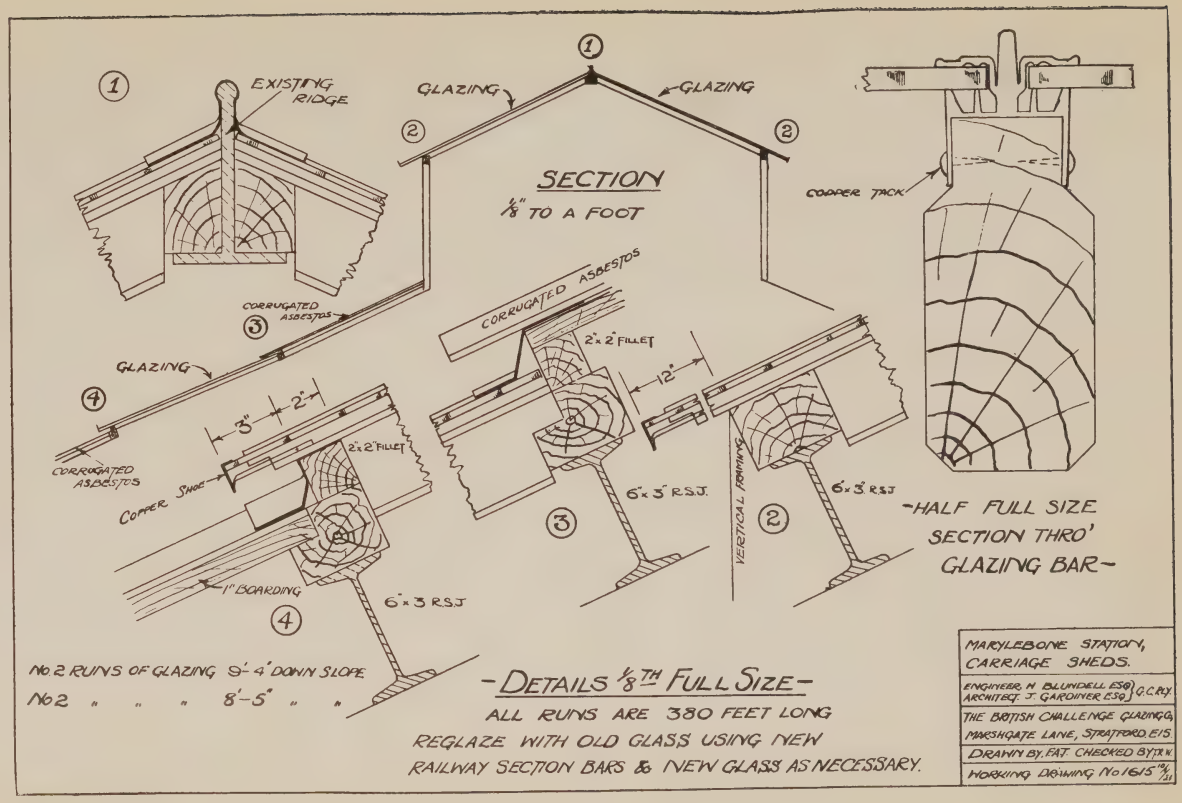
Central Car Repair Depot, Charlton. London County Council.

Superintending Architect, G. Topham Forrest, Esq., F.R.I.B.A.


TYPICAL ROOF SLOPE
SCALES
INCHES/12 0 10 FEET
INCHES/12 0 1 2 3 4 5 6 7 8 9 10 FEET
INCHES/12 9 6 3 0 1 FOOT
7'-5¾"
7'-5¾"
7'-5¾"
7'-5¾"
7'-5¾"
5'-6"
18"
11½"
9"x 3"
2"x 1½"
FACE OF STANCHION
10"x 6" R.S.J.
6" R.W.P.
5"x 4½" R.S.J.
3"x 2"x ¼" L
STANY.
T
S
R
Q
13'-0"
13'-0"
13'-0"
13'-0"
TOTAL QUANTITY ABT.
40,000 FEET SUPER
CAR REPAIR DEPOT
CHARLTON
FOR LONDON COUNTY COUNCIL
ARCH'T G. TOPHAM FORREST ESQ. F.R.I.B.A.
THE BRITISH CHALLENGE GLAZING CO.
MARSHGATE LANE, STRATFORD, E.15.
DRAWN BY F.A.T.
EXTRACTS FROM WORKING DRAWINGS

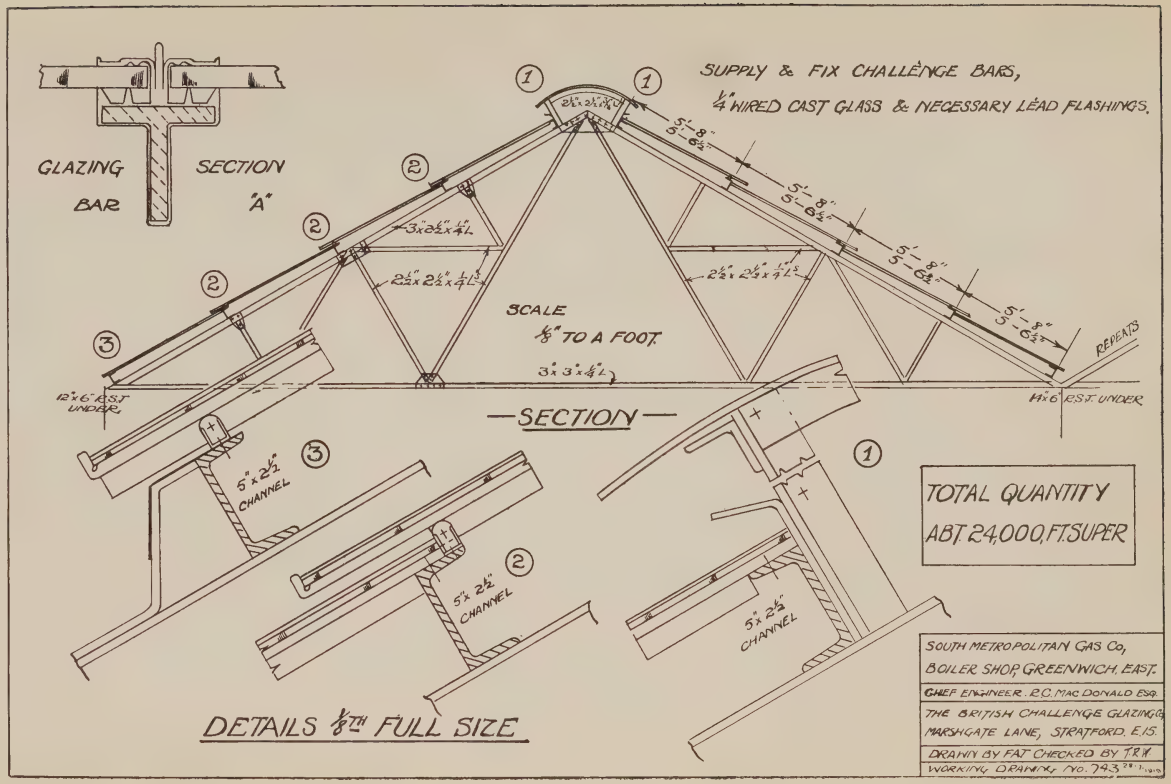
Carriage Cleaning Sheds, Marylebone Station, L. & N. E. R. (G. C. Section.)

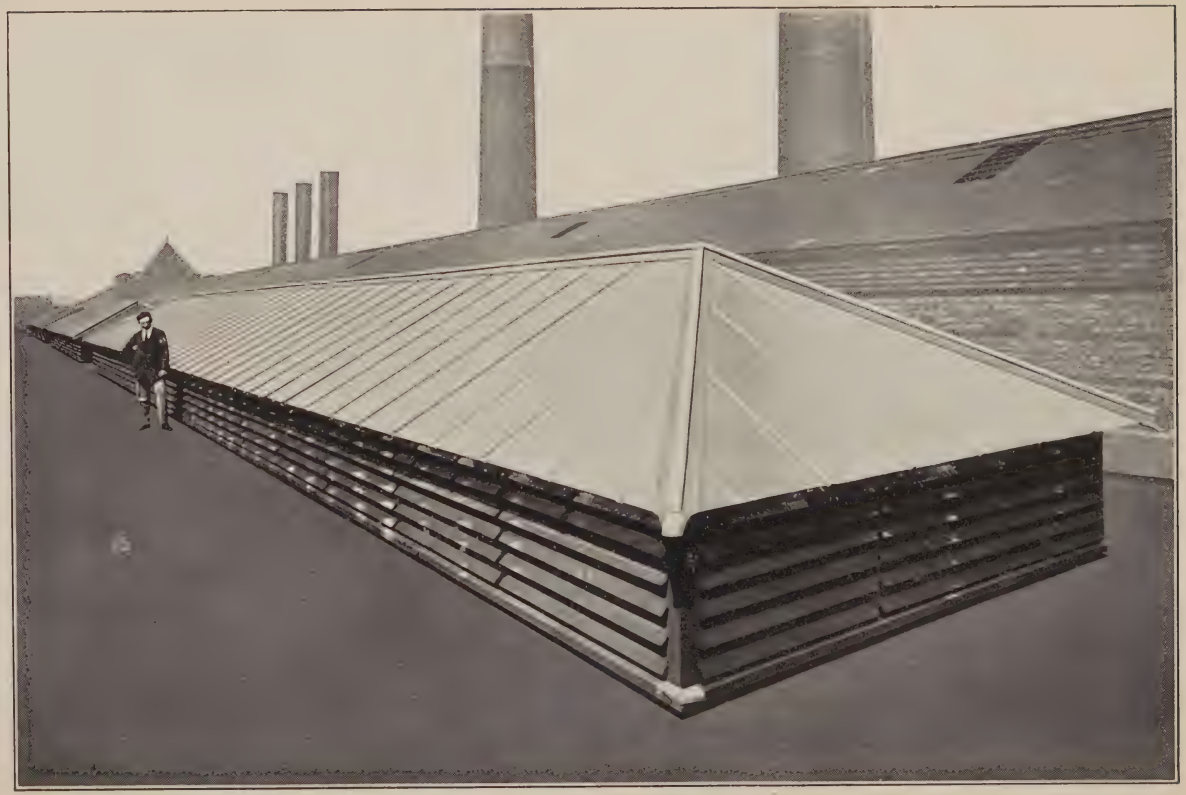
Contractor, Mr. Thos. Carr, Halifax. Engineer, H. Blundell, Esq. Architect, J. Gardiner, Esq.



NOTE.—Special Railway Section Used.

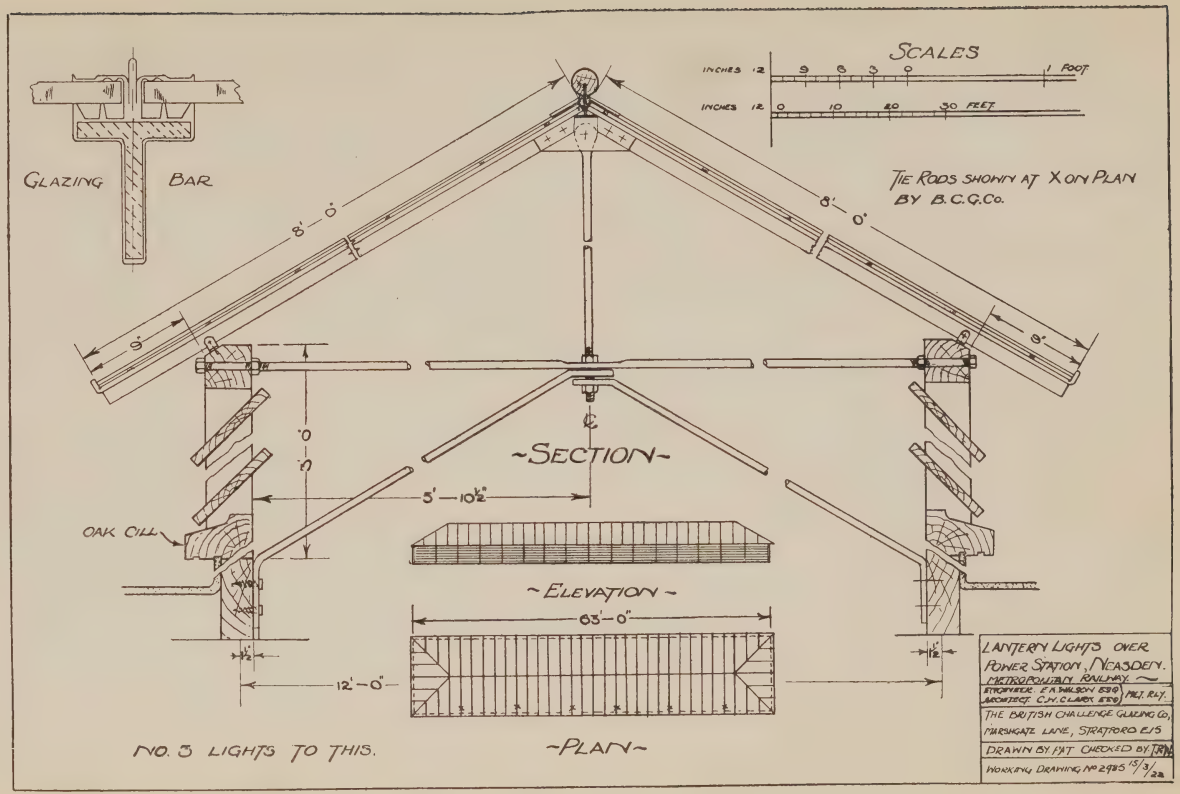
Fitters' Shop, South Metropolitan Gas Works, East Greenwich, London, S.E.

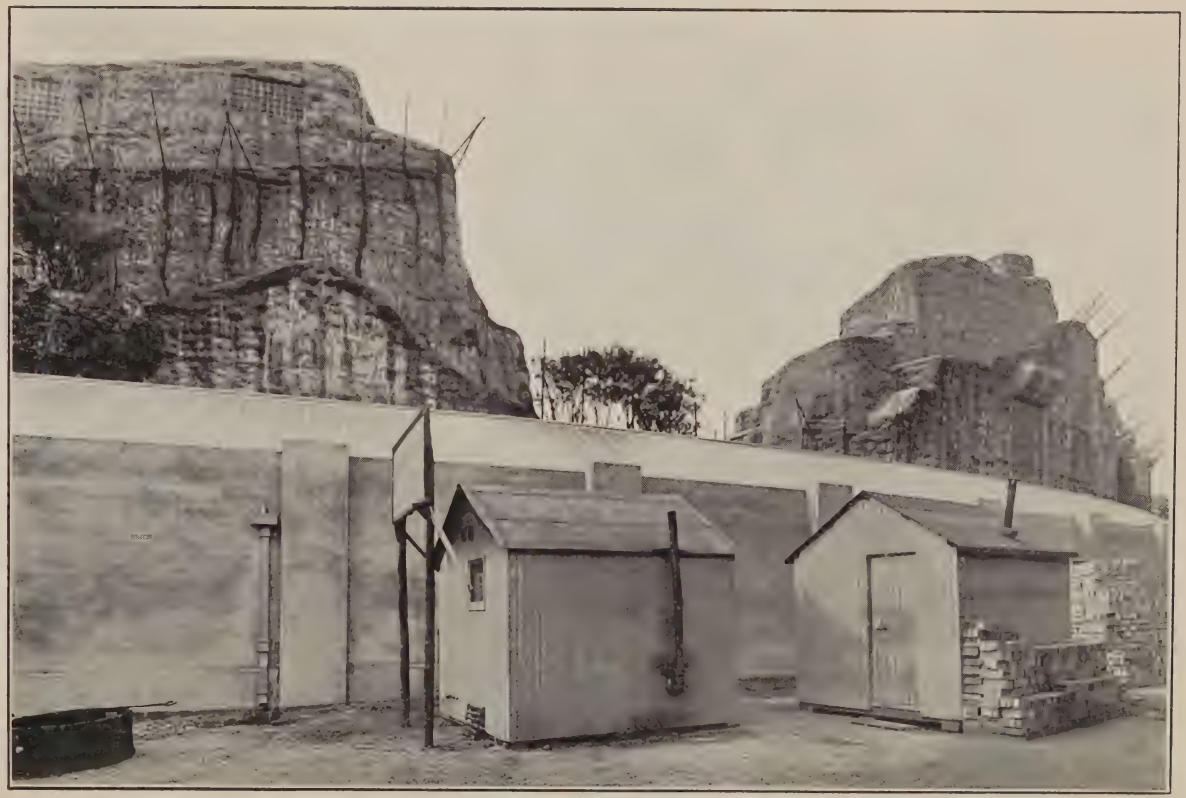

GLAZING BAR SECTION "A"
SUPPLY & FIX CHALLENGE BARS,
¼" WIRED CAST GLASS & NECESSARY LEAD FLASHINGS.
SCALE ⅛" TO A FOOT.
—SECTION—
REPEATS
12"x6" E.S.T. UNDER
14"x6" E.S.T. UNDER
5" x 2½" CHANNEL
5" x 2½" CHANNEL
5" x 2½" CHANNEL
TOTAL QUANTITY
ABT. 24,000 FT. SUPER
DETAILS ⅛TH FULL SIZE
SOUTH METROPOLITAN GAS Co,
BOILER SHOP, GREENWICH, EAST.
CHIEF ENGINEER. R.C. MAC DONALD ESQ.
THE BRITISH CHALLENGE GLAZING Co.
MARSHGATE LANE, STRATFORD. E.15.
DRAWN BY FAT CHECKED BY T.R.W.
WORKING DRAWING NO. 743



Lantern Lights over Power House, Neasden, Metropolitan Railway.

Architect, C. W. Clark, Esq., A.R.I.B.A. Engineer, E. A. Wilson, Esq., M.Inst.C.E.

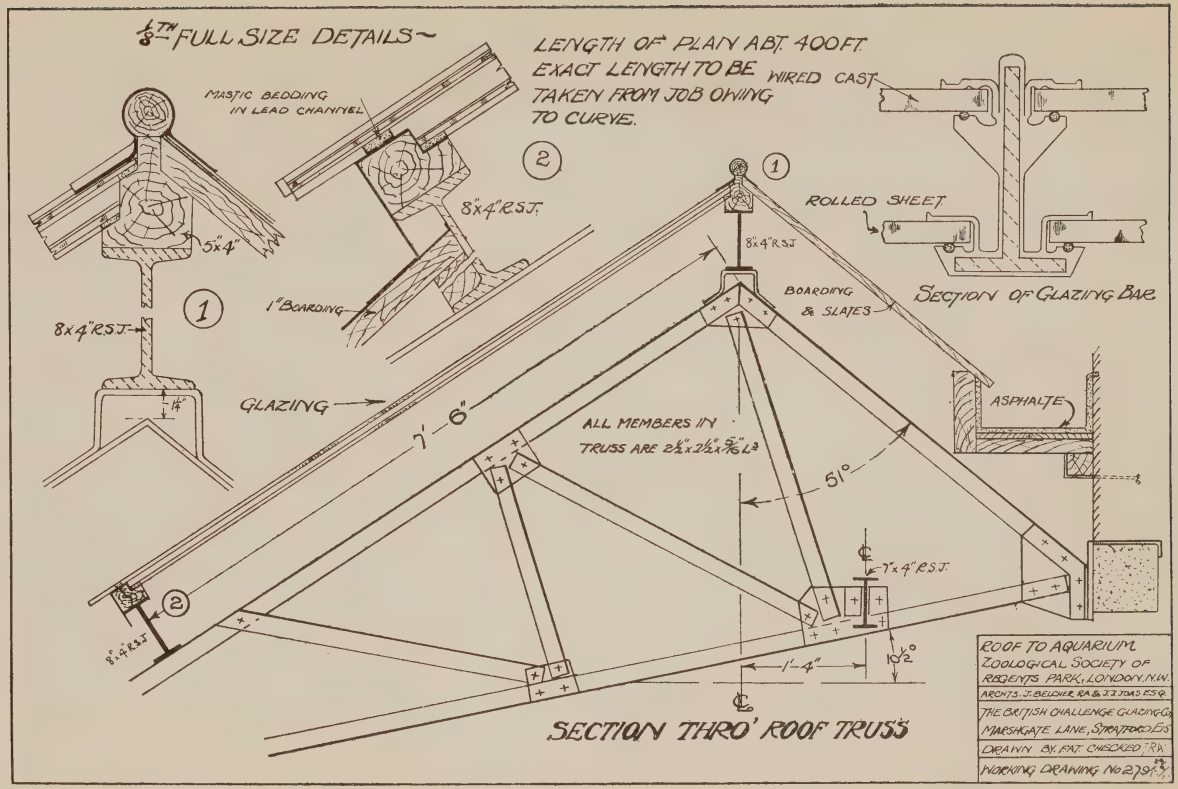

GLAZING BAR
SCALES
INCHES 12 9 6 3 0 1 FOOT
INCHES 12 0 10 20 30 FEET
TIE RODS SHOWN AT X ON PLAN BY B.C.G.Co.
8'-0"
8'-0"
9'
9'
~SECTION~
5'-10½"
OAK CILL
~ELEVATION~
63'-0"
12'-0"
~PLAN~
NO. 3 LIGHTS TO THIS.
LANTERN LIGHTS OVER POWER STATION, NEASDEN.
METROPOLITAN RAILWAY
ENGINEER. E.A. WILSON ESQ. M.I. RLY.
ARCHITECT. C.H. CLARK ESQ.
THE BRITISH CHALLENGE GLAZING CO.
MARSHGATE LANE, STRATFORD E.15
DRAWN BY H.T. CHECKED BY
WORKING DRAWING No 2985 15/3/22



New Aquarium, Zoological Gardens, London.

Contractors, Messrs. J. Jarvis & Sons, Ltd.

Architects, Messrs. Belcher & Joass.



Double Glazing used to keep even temperature over the Aquarium Tanks.

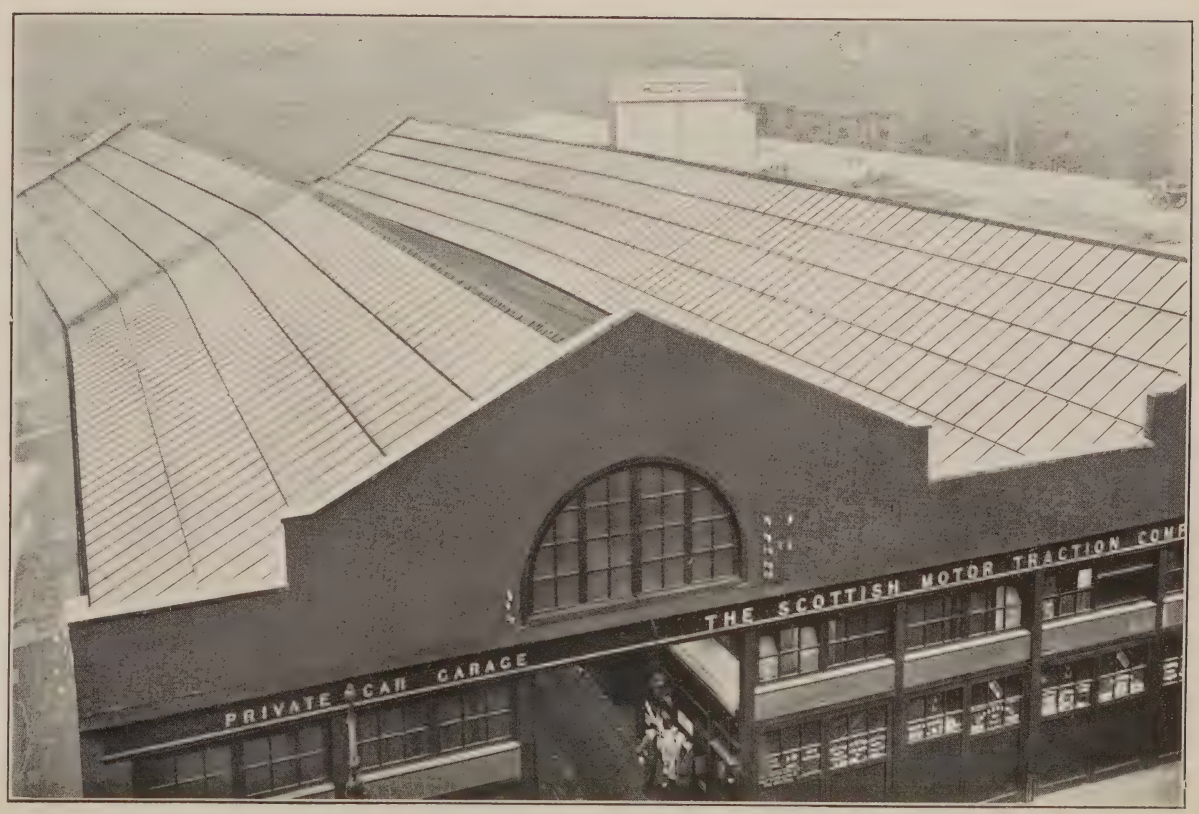
Lion House, Zoological Gardens, London.

The old putty glazing has been stripped and replaced by us with patent glazing and Messrs. Chance Bros.' "VITA GLASS" with great benefit to the Animals.

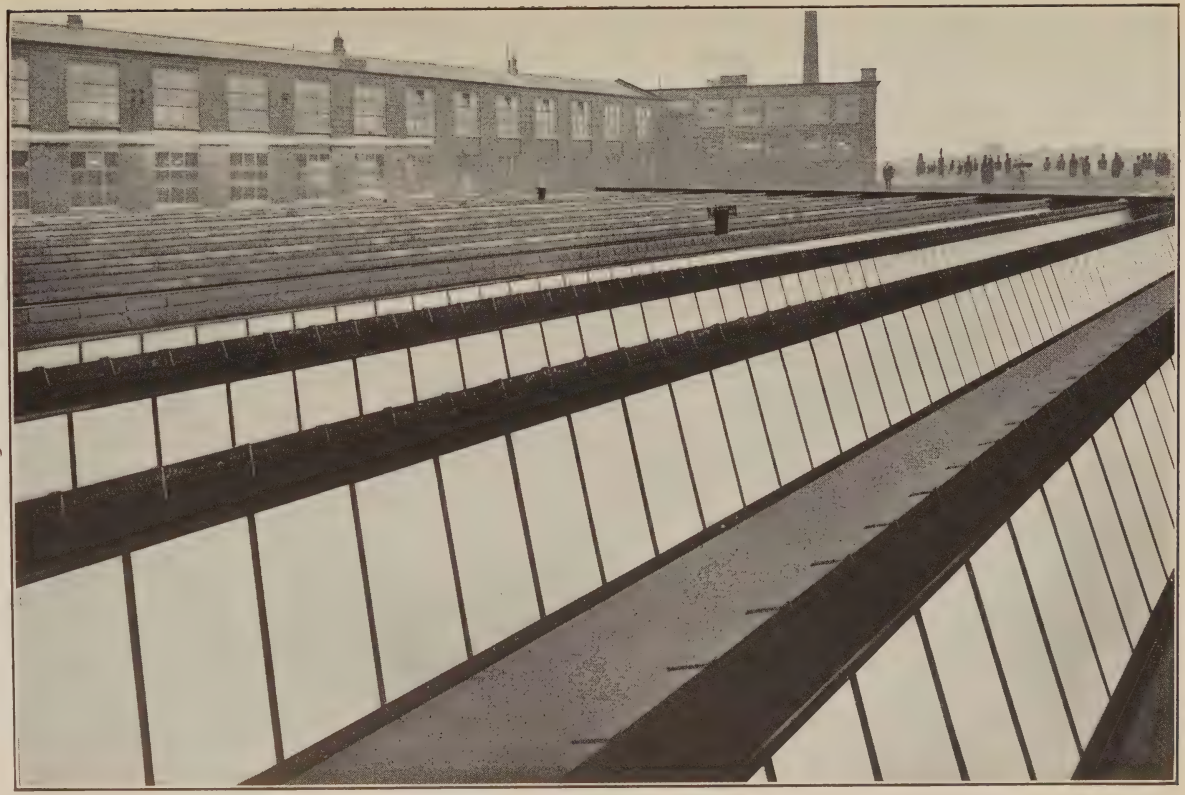
Power House, Hastings Tramway Co.

(Challenge Glazing replaced a Zinc Cap System.)

Engineer and General Manager, W. Vincent Edwards, Esq., M.Inst.C.E.



Scottish Motor Traction Company, Edinburgh.
(Fixed about 25 years ago.)



Egyptian Mills, Bury, Lancs.

Architect, Roger Wood, Esq., Bury.

Messrs. Hazell, Watson & Viney, Ltd., Printing Works, Aylesbury.

Contractors, Messrs. Webster & Cannon. Note various types of Ventilators employed. Architect, W. Ernest Hazell, Esq., F.R.I.B.A.

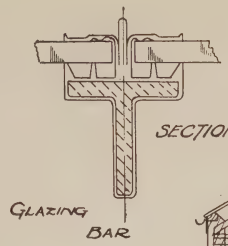
Glazed Roof to Approach, Baker Street Station, Metropolitan Railway.

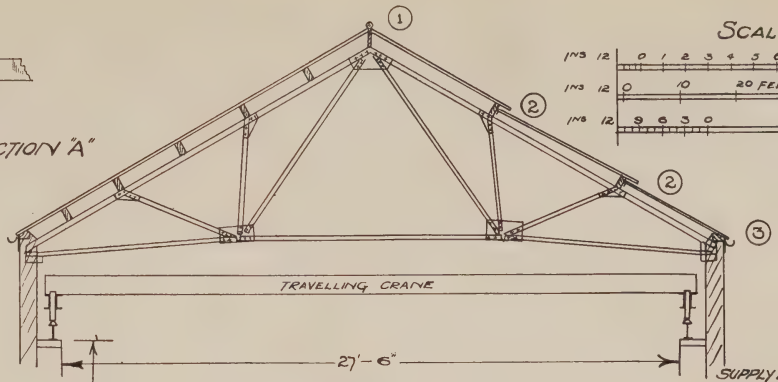
Contractors, Messrs. Bovis, Ltd.

Engineer, E. A. Wilson, Esq., M.Inst.C.E,
Architect, C. W. Clark, Esq., A.R.I.B.A.

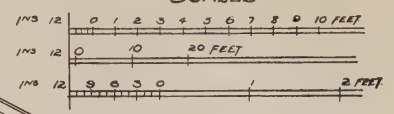
Roof over Large Plate Glass Store for Messrs. Robinson, King & Co., Stratford.

Showing Steelwork and Glazing supplied and erected complete by us.

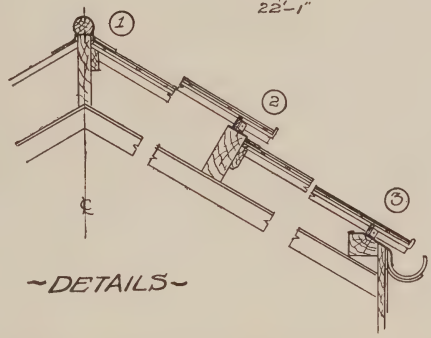




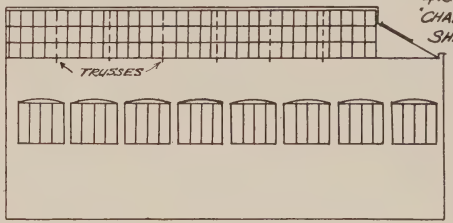
~SECTION~



SUPPLY & FIX No. 8 TRUSSES, GUTTERS, PURLINS, RIDGE, "CHALLENGE" GLAZING BARS & 4" R.C. TO ROOF — TO VERTICAL "CHALLENGE" BARS & 4" ROLLED SHEET GLASS & FLASHINGS.



~DETAILS~



~ELEVATION~

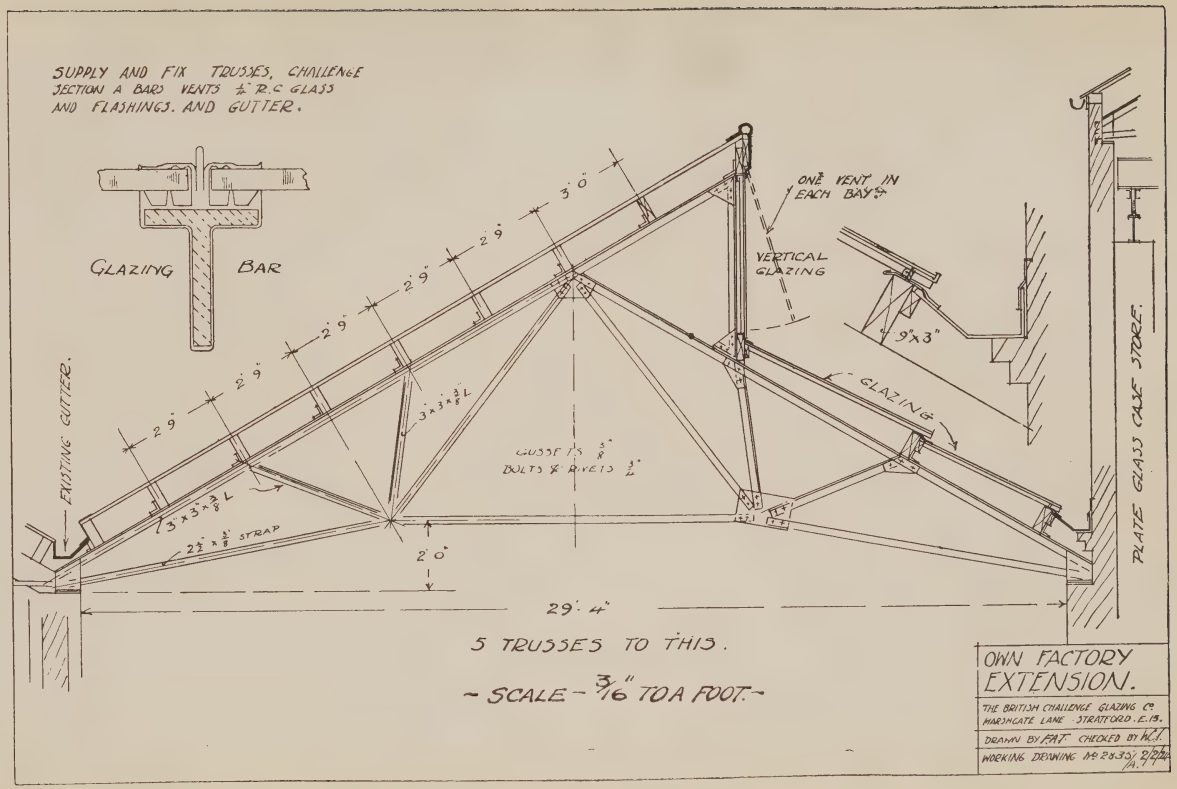
OWN PLATE STORE on NEW PROPERTY.

THE BRITISH CHALLENGE GLAZING Co, MARSHGATE LANE, STRATFORD. E.15.

DRAWN BY F.A.T. CHECKED BY T.R.N.

WORKING DRAWING No 2561

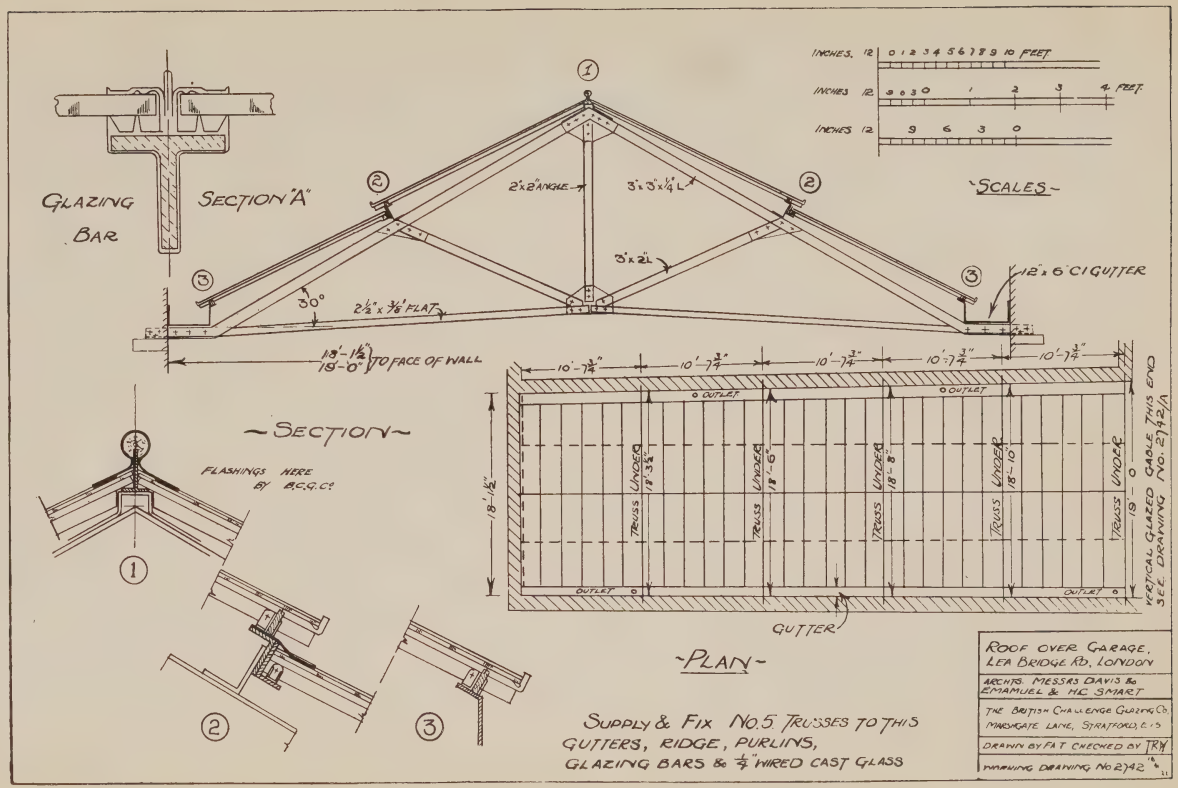
Extension to our Factory. Showing Steelwork and Glazing by us.

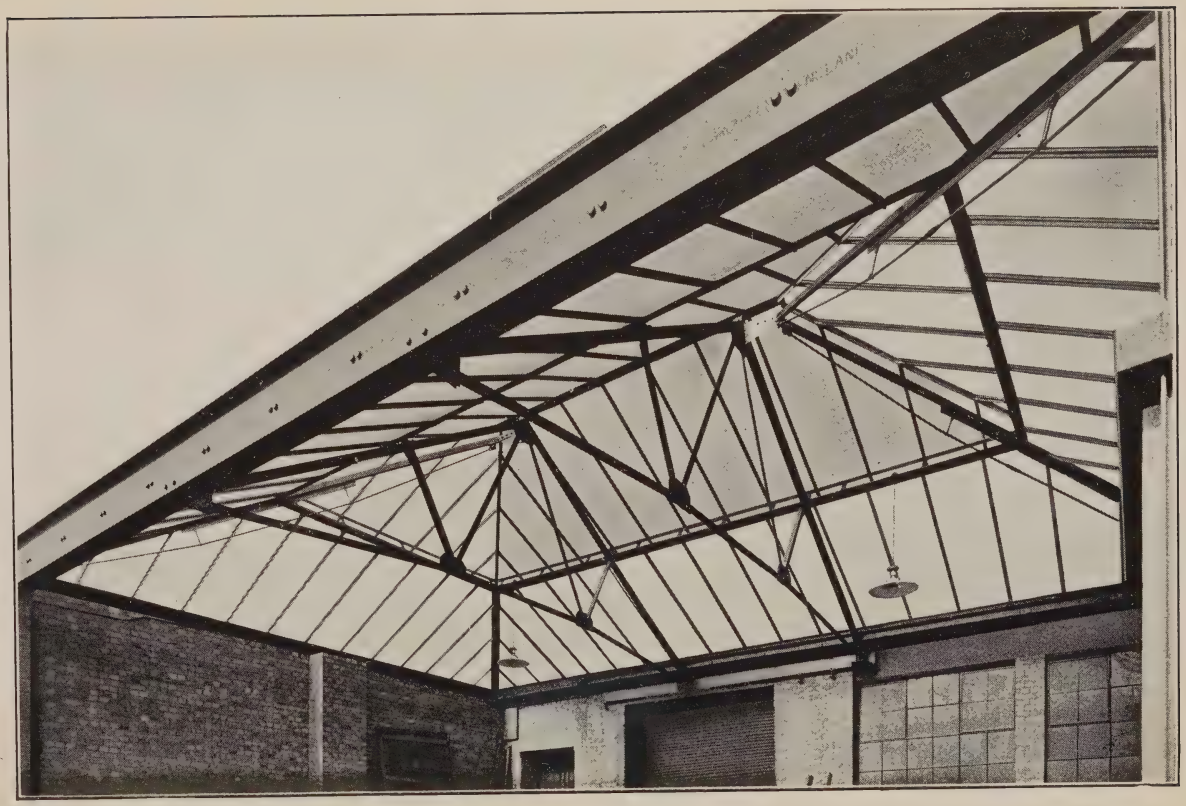

SUPPLY AND FIX TRUSSES, CHALLENGE SECTION A BARS VENTS ¼" R.C GLASS AND FLASHINGS. AND GUTTER.
GLAZING BAR
ONE VENT IN EACH BAY
VERTICAL GLAZING
9"x3"
GLAZING
PLATE GLASS CASE STORE.
EXISTING GUTTER.
2'9"
3'0"
3"x3"x⅜ L
GUSSETS ⅝" BOLTS & RIVETS ¾"
2½" x ⅜" STRAP
2'0"
29'4"
5 TRUSSES TO THIS.
~ SCALE - 3/16" TO A FOOT. ~
OWN FACTORY EXTENSION.
THE BRITISH CHALLENGE GLAZING Co
HARSMCATE LANE STRATFORD. E.15.
DRAWN BY F.A.T. CHECKED BY W.C.
WORKING DRAWING No 2833/ 8/1924
A.7

Garage, Lea Bridge Road, London, E.

Steelwork and Glazing erected complete by us.

Contractor, Mr. C. R. Price. Architects, Messrs. Davis & Emanuel and Henry C. Smart.


GLAZING BAR
SECTION "A"
2"x2"ANGLE
3"x3"x¼"L
3"x2½"
30°
2½"x⅜" FLAT
12"x6" CI GUTTER
18'-1½" / 18'-0" TO FACE OF WALL
~SECTION~
FLASHINGS HERE BY B.C.G.Co
INCHES 12 0 1 2 3 4 5 6 7 8 9 10 FEET
INCHES 12 3 0 3 0 1 2 3 4 FEET
INCHES 12 9 6 3 0
~SCALES~
10'-7¼" 10'-7¾" 10'-7¾" 10'-7¾" 10'-7¾"
OUTLET
TRUSS UNDER 18'-3½"
TRUSS UNDER 18'-6"
TRUSS UNDER 18'-8"
TRUSS UNDER 18'-10"
TRUSS UNDER 19'-0"
18'-1½"
GUTTER
~PLAN~
VERTICAL GLAZED GABLE THIS END SEE DRAWING No. 2742/A
SUPPLY & FIX No.5 TRUSSES TO THIS GUTTERS, RIDGE, PURLINS, GLAZING BARS & ¼" WIRED CAST GLASS
ROOF OVER GARAGE, LEA BRIDGE Rd. LONDON
ARCHTS. MESSRS DAVIS & EMANUEL & HC SMART
THE BRITISH CHALLENGE GLAZING Co. MARGATE LANE, STRATFORD, E.15
DRAWN BY F.A.T. CHECKED BY TRH
WORKING DRAWING No. 2742

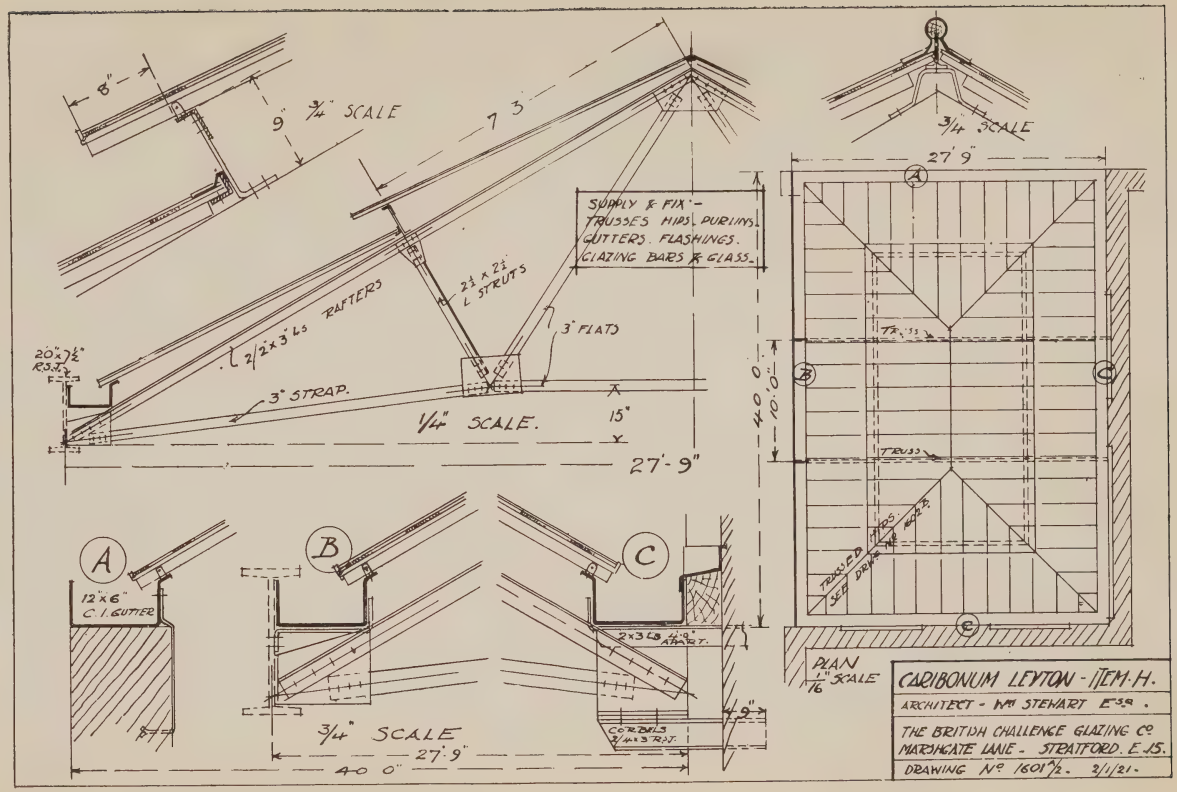


Loading Platform, Caribonum Works, Leyton.

Roof supplied and erected complete by us, including Constructional Steelwork.

Contractor, Mr. A. E. Symes.

Architect, Wm. Stewart, Esq., F.R.I.B.A.

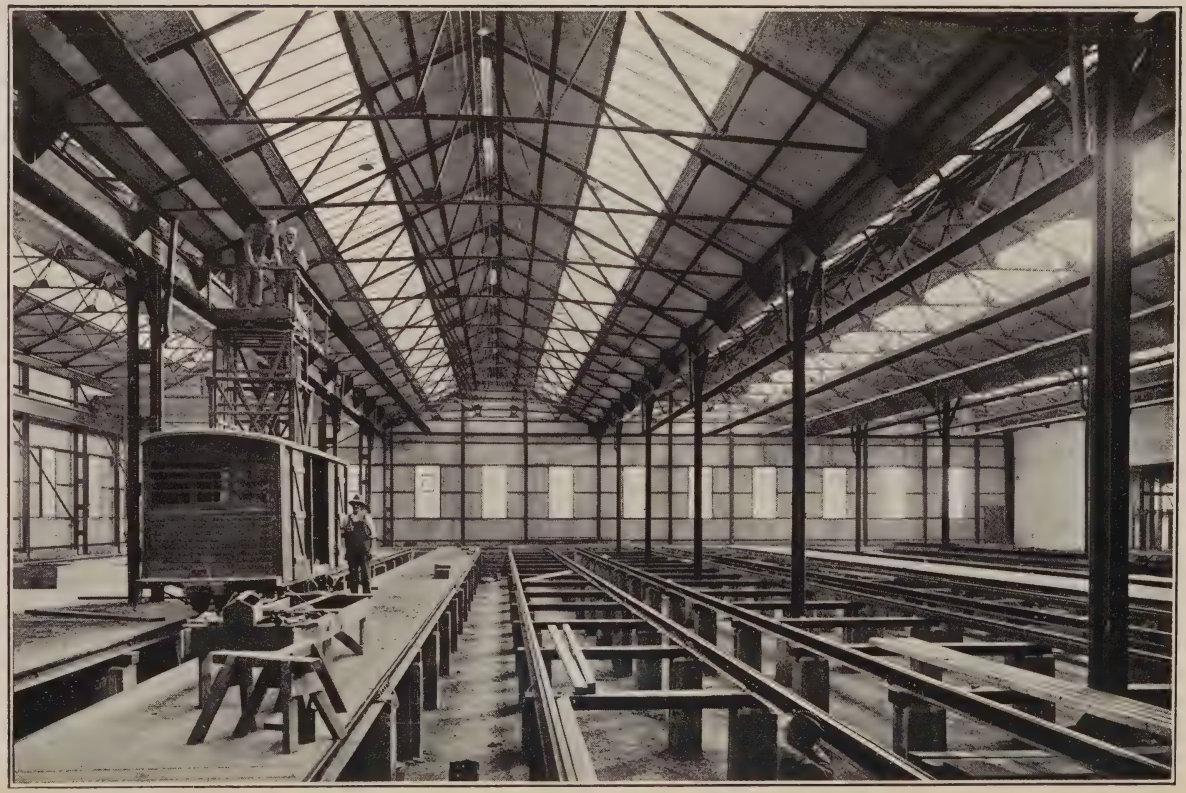


CARIBONUM LEYTON - ITEM H.

ARCHITECT - Wm STEWART E.C.S.

THE BRITISH CHALLENGE GLAZING Co
MARSHGATE LANE - STRATFORD. E.15.

DRAWING No 1601/2. 2/1/21.



Running Sheds and Workshops, Tramways Department, Johannesburg Municipality.

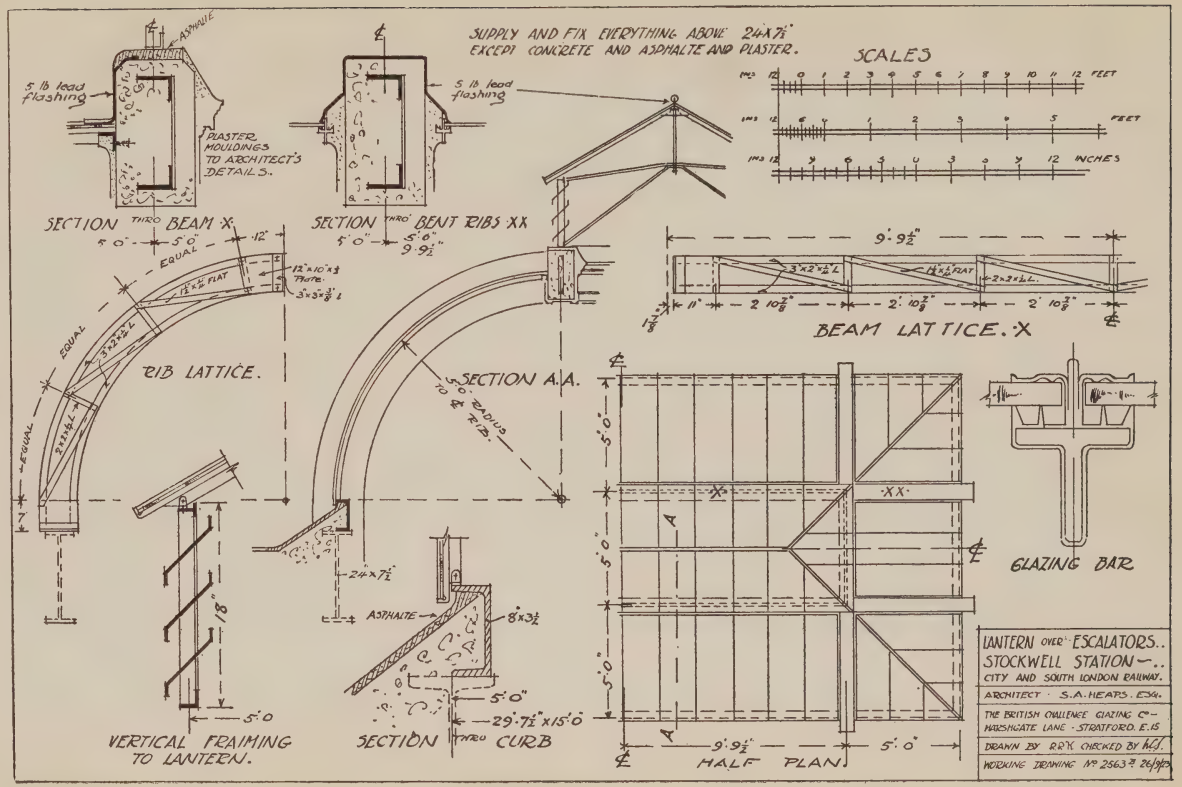
Stockwell Station, London Electric Railway.

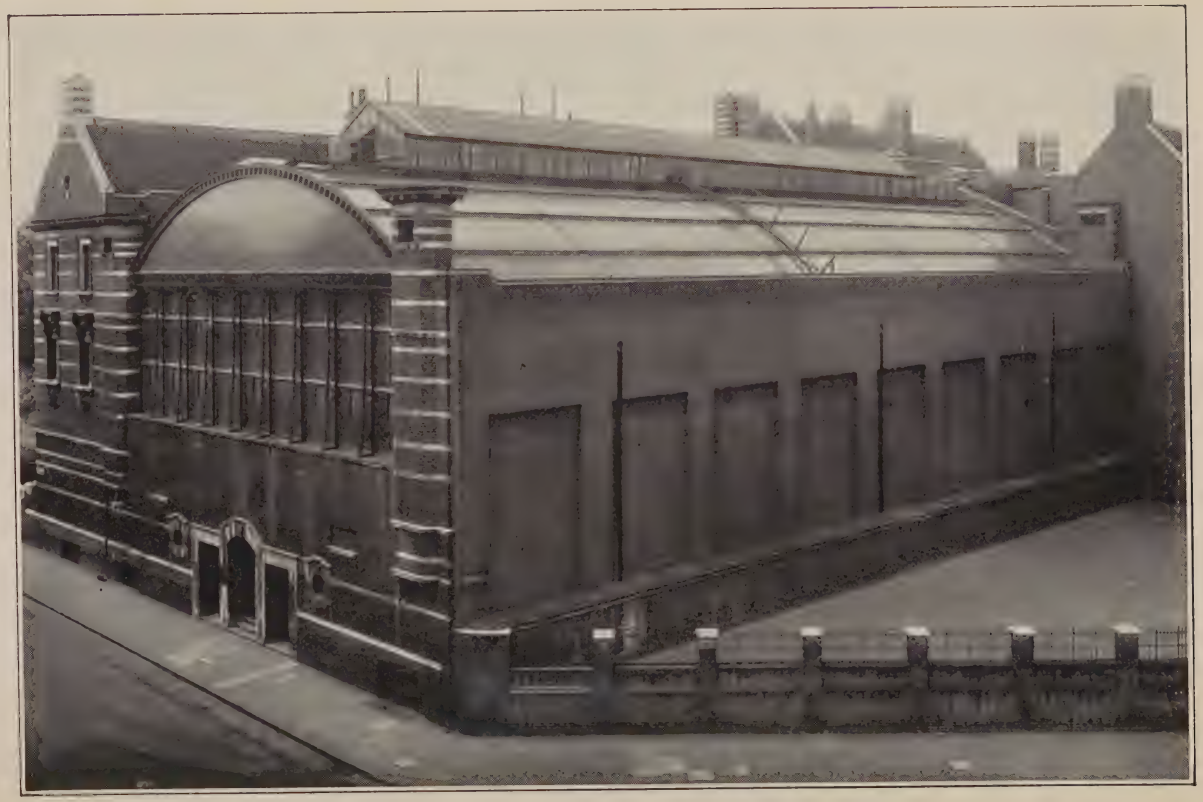
Bent Lantern Skylight after Completion.

S. A. Heaps, Esq., Architectural Officer, London Electric Railway.

Bent Lantern Skylight for Stockwell Station, London Electric Railway.

Erected in our Works for fitting of bent glass, before despatch to site.


SUPPLY AND FIX EVERYTHING ABOVE 24"x7½" EXCEPT CONCRETE AND ASPHALTE AND PLASTER.
SCALES
FEET
FEET
INCHES
ASPHALTE
5 lb lead flashing
PLASTER MOULDINGS TO ARCHITECT'S DETAILS.
SECTION THRO BEAM X
SECTION THRO' BENT RIBS XX
RIB LATTICE.
BEAM LATTICE. X
SECTION A.A.
GLAZING BAR
VERTICAL FRAIMING TO LANTERN.
SECTION THRU CURB
HALF PLAN
LANTERN OVER ESCALATORS.. STOCKWELL STATION —.. CITY AND SOUTH LONDON RAILWAY.
ARCHITECT · S.A. HEARS. ESQ.
THE BRITISH CHALLENGE GLAZING Co — HAINSHGATE LANE · STRATFORD. E.15
DRAWN BY R.D.K. CHECKED BY H.J.
WORKING DRAWING No 2563 3 26/9/27



Royal Horticultural Hall, Westminster, S.W. 1.

The whole of the Roof Glazing, Lantern Skylight and Vertical Glazing renewed throughout by us, 1925-6.

Architect, Walter M. Epps, Esq., F.R.I.B.A.

Watford Station, Metropolitan Railway.

Contractors, Messrs. Logan & Hemingway, Ltd.

Chief Engineer, E. A. Wilson, Esq., M.Inst.C.E.
Architect, C. W. Clark, Esq., A.R.I.B.A.

Croxley Green Station, Metropolitan Railway.

(Canopy Supplied and Erected complete by us.)

Contractors, Messrs. W. J. Maddison Ltd.

Chief Engineer, E. A. Wilson, Esq., M.Inst.C.E.
Architect, C. W. Clark, Esq., A.R.I.B.A.

Edgware Road Station, Metropolitan Railway.

(Canopy Supplied and Erected complete by us.)

Contractors, The Pitcher Construction Co., Ltd.

Chief Engineer, E. A. Wilson, Esq., M.Inst.C.E.
Architect, C. W. Clark, Esq., A.R.I.B.A.

Covered Yard to Garage, Stone Manor, Worcestershire.

Steelwork and Glazing Supplied and Erected by us.

Contractors. Messrs. H. Martin, Ltd.

Architects, Messrs. E. T. & E. S. Hall, F.F.R.I.B.A.

Lantern Skylights, St. George's Hospital, London, S.W.

Contractors, Messrs. Prestige & Co., Ltd.

Architects, Messrs. Adams, Holden & Pearson, F.F.R.I.B.A.

Agents, William Jacks & Co., Shanghai.

Central Arcade, Shanghai.

Contractors, Messrs. Sin Jin Kee.

Architects, Messrs. Palmer & Turner, Shanghai.

Agents, William Jacks & Co., Shanghai.

Central Arcade, Shanghai.

Contractors, Messrs. Sin Jin Kee.

Architects, Messrs. Palmer & Turner, Shanghai.

Messrs. J. Lyons & Co., Ltd., New Offices, Cadby Hall, Kensington.

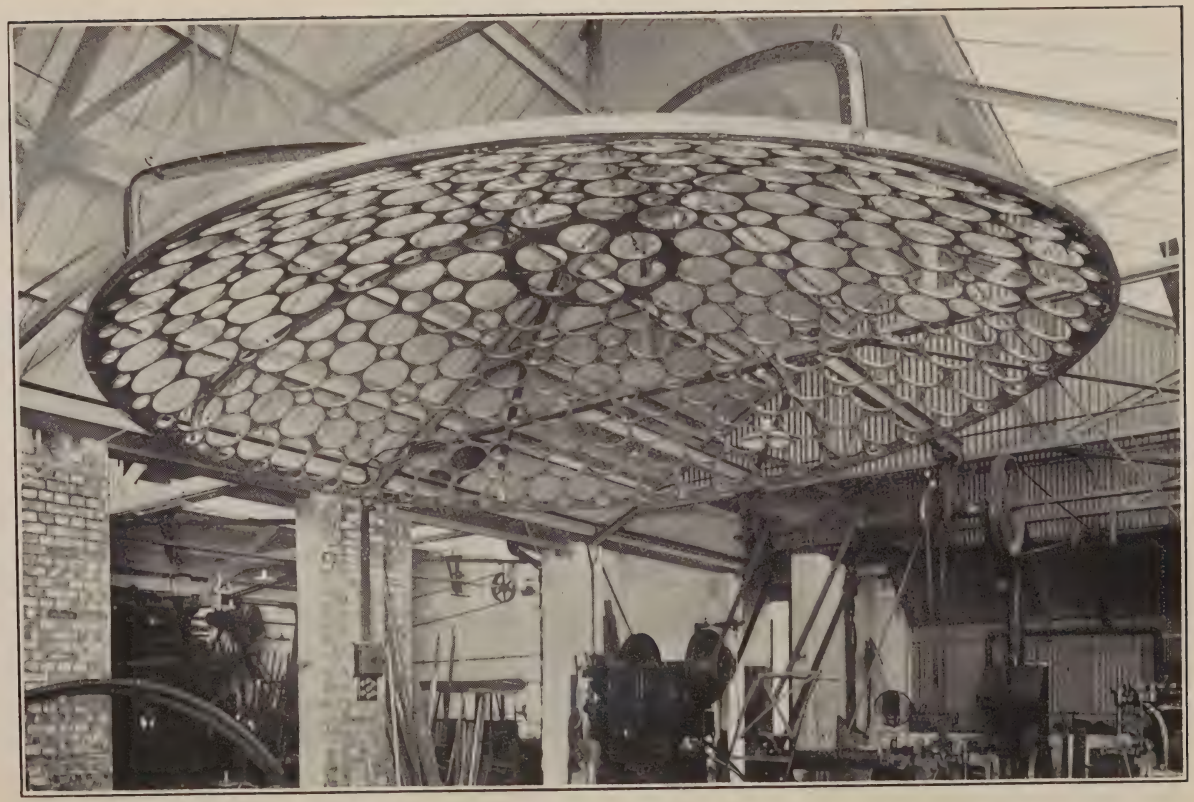
Some of the Forty-two Challenge Standard Lantern Skylights.

Architects, Messrs. Holman & Goodrham.

Messrs. J. Lyons & Co., Ltd., New Offices, Cadby Hall, Kensington.

Some of the Specially Made Lantern Skylights.

Architects. Messrs. Holman & Goodrham.



Cupola for Moulin Rouge, Paris.

This is suspended snugly under a concrete dome. Each Circle is fitted with our Barkay Patent Glass Reflector and an electric lamp, focussed to a predetermined point.

Victoria and Albert Hotel, Torquay.

Double Glazed Dome.

Internal Glazing :— Leaded Lights.

External :— Bent Rough Cast.

General Contractors, Messrs. T. Vanstone & Sons, Ltd.

Restaurant, Moorgate Station, Metropolitan Railway.

Contractors, Messrs. Ford & Walton.

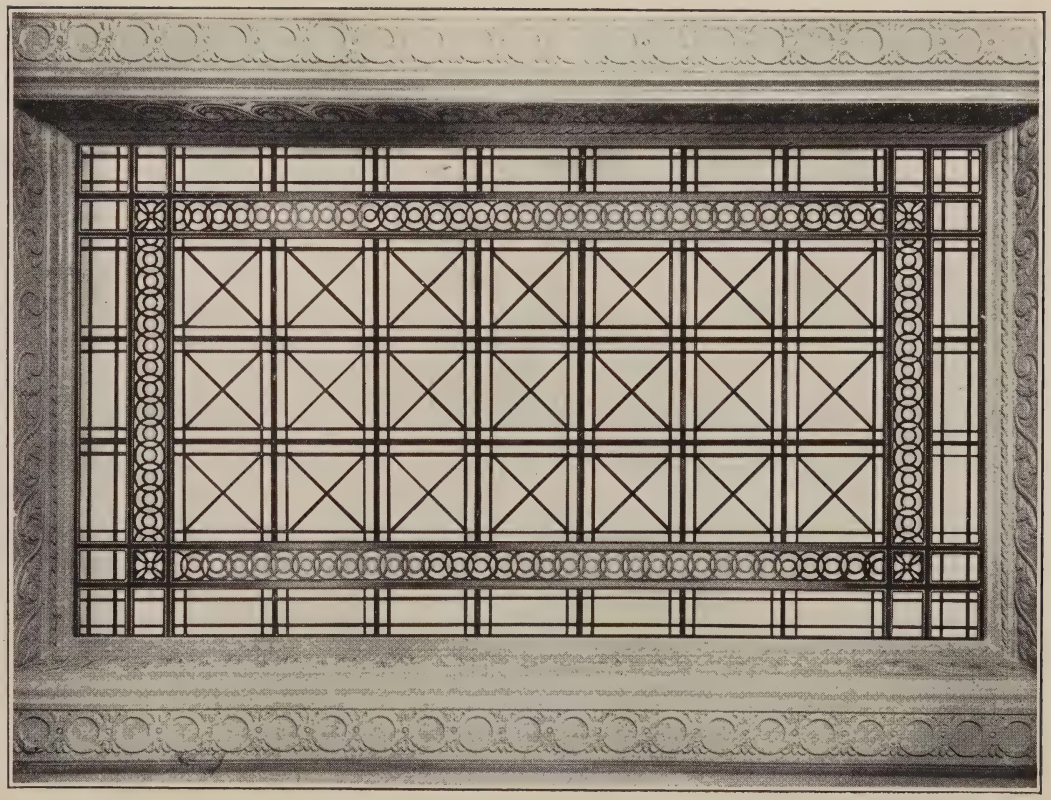
Engineer, E. A. Wilson, Esq., M.I.C.E.
Architect, C. W. Clark, Esq., A.R.I.B.A.

Banking Hall, Midland Bank Ltd., Pall Mall, London, S.W.

Ornamental Ceiling Light with Lantern over.

General Contractors, Messrs. Hall, Beddall & Co.

Architects, Messrs. Whinney, Son & Austen Hall.

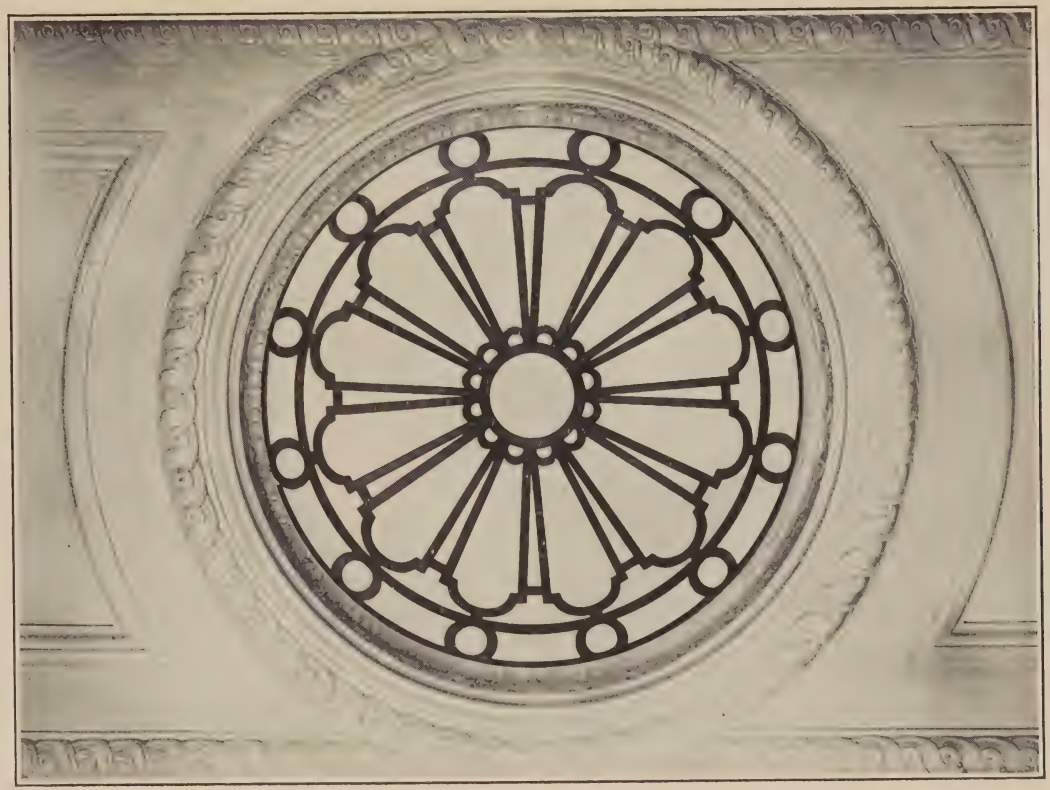


Midland Bank Ltd., Pall Mall, London, S.W.

Ornamental Metal Ceiling Light.

General Contractors, Messrs. Hall, Beddall & Co.

Architects, Messrs. Whinney, Son & Austen Hall.



Midland Bank Ltd., Pall Mall, London, S.W.

Ornamental Inner Dome.

General Contractors, Messrs. Hall, Beddall & Co.

Architects, Messrs. Whinney, Son & Austen Hall.

PART IV.

"CHALLENGE"

ELECTRO COPPER GLAZING.

"CHALLENGE"

COPPER FIRE-RESISTING GLAZING.

The London Building (Amendments) Act, 1905, insists upon the use of glazing in a definite manner in certain buildings and positions, mainly around staircases, lift enclosures and corridors.

Extracts from and interpretations of the Act are as follows :—

Thickness of glass not less than $\frac{1}{4}$-inch. Glass must be in direct combination with metal, the melting point of which is not lower than 1,800° Fahrenheit.

Squares of glass must not exceed 16 square inches (*i.e.*, 4-in. by 4-in. ; 8-in. by 2-in., &c.), and can be of any shape.

Panels must not exceed 2 feet either way (*i.e.*, 4-ft. by 1-ft. will not do).

Panels can be joined together with metal division bars so that a window or door panel of any size can be built up.

Panels must be secured with metal or hard-wood beads ; securing by putty is not permissible.

Metals permissible under the Act are iron, steel, copper and bronze.

In forming the panels the squares of glass are each divided by and secured with copper cames of various sections.

There are a large number of different kinds of glass, both plain and coloured, that may be used.

It can, therefore, be seen that with rectangular squares of correct proportions and a judicious choice of glass, pleasing designs can be introduced, still conforming to the requirements of the Act.

Bent glass within the above sizes in copper glazing is permissible.

THE USE OF COPPER GLAZING IS NOT, however, confined to meeting the requirements of the above Act, but is frequently required by the Fire Insurance Offices, and it is now being largely used solely for its ornamental properties, not only in London, and throughout the United Kingdom, but also abroad. It can be made in similar designs to leaded lights with greater safety, being very strong, and possessing high burglar-resisting qualities.

The framework of our panels, if placed in a fire will not distort until well after the glass has melted and run out, as we do not rely upon soldered joints alone, but interlock the cames when building up the panels.

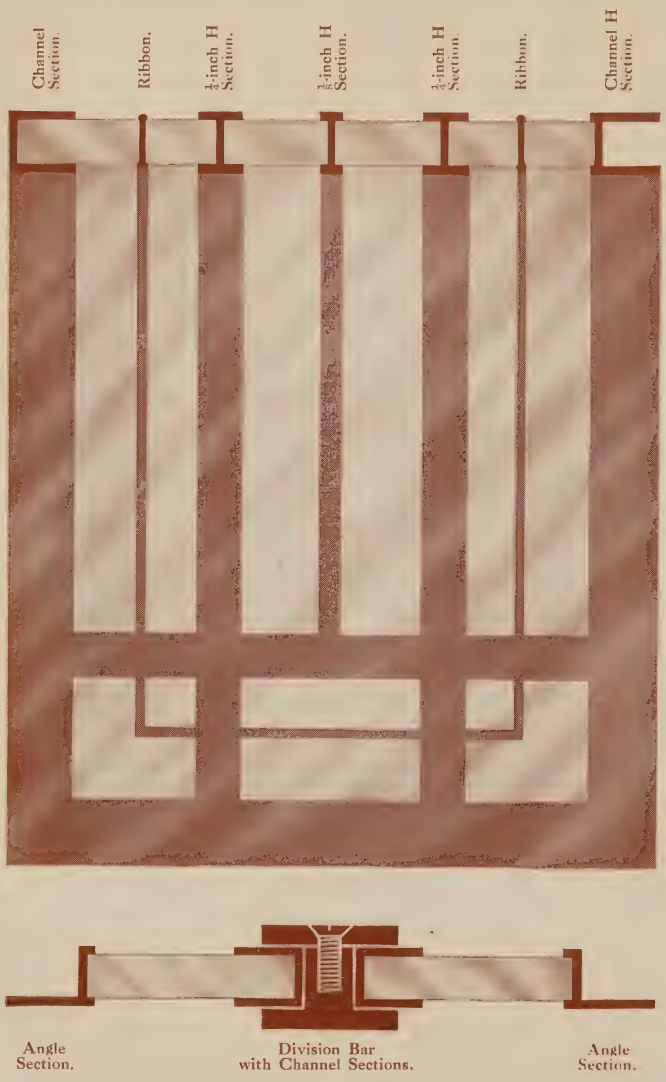
Prismatic glass is frequently introduced to refract daylight to the back of dark rooms or shops. This glass is made with three different refracting angles, *i.e.*, Nos. 1, 2 and 3. Care must be exercised in selecting the most suitable angle. Particulars giving size of windows and positions in the building, together with the relation of surrounding property, are required before the suitable prism can be selected.

The working sizes required are :—

Sight sizes of openings (height to be given first) and depth and width of rebate.

In adjoining panels of varying sizes (such as a screen with doors) it is advisable to supply an accurately dimensioned elevation, so that continuous alignment of the cames can be arranged.

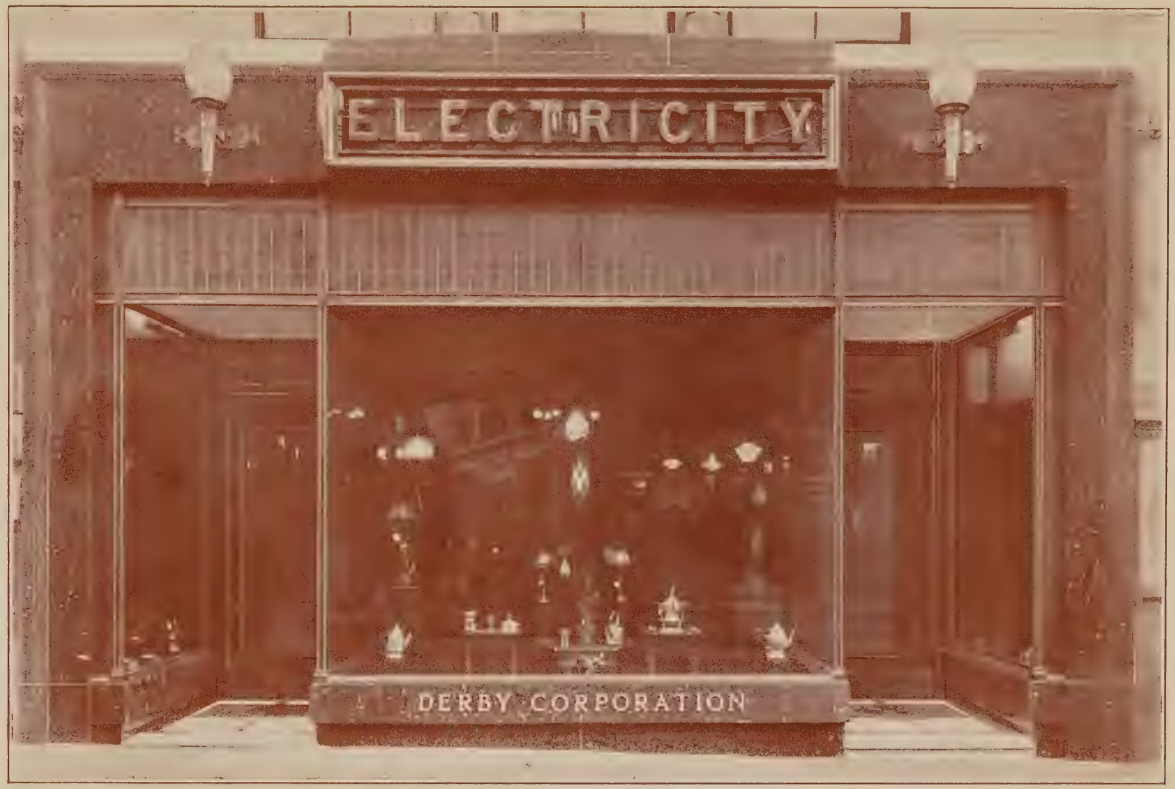
FULL-SIZE SECTIONS OF CAMES, &c.



Intermediate Cames in H Section are also available $\frac{3}{8}''$ and $\frac{1}{2}''$ wide.

Messrs. A. W. Gamage, Ltd., High Holborn, London.

"Challenge" Copper Glazing supplied to the instructions and designs of Messrs. Harris & Sheldon, Ltd., Shopfitters.

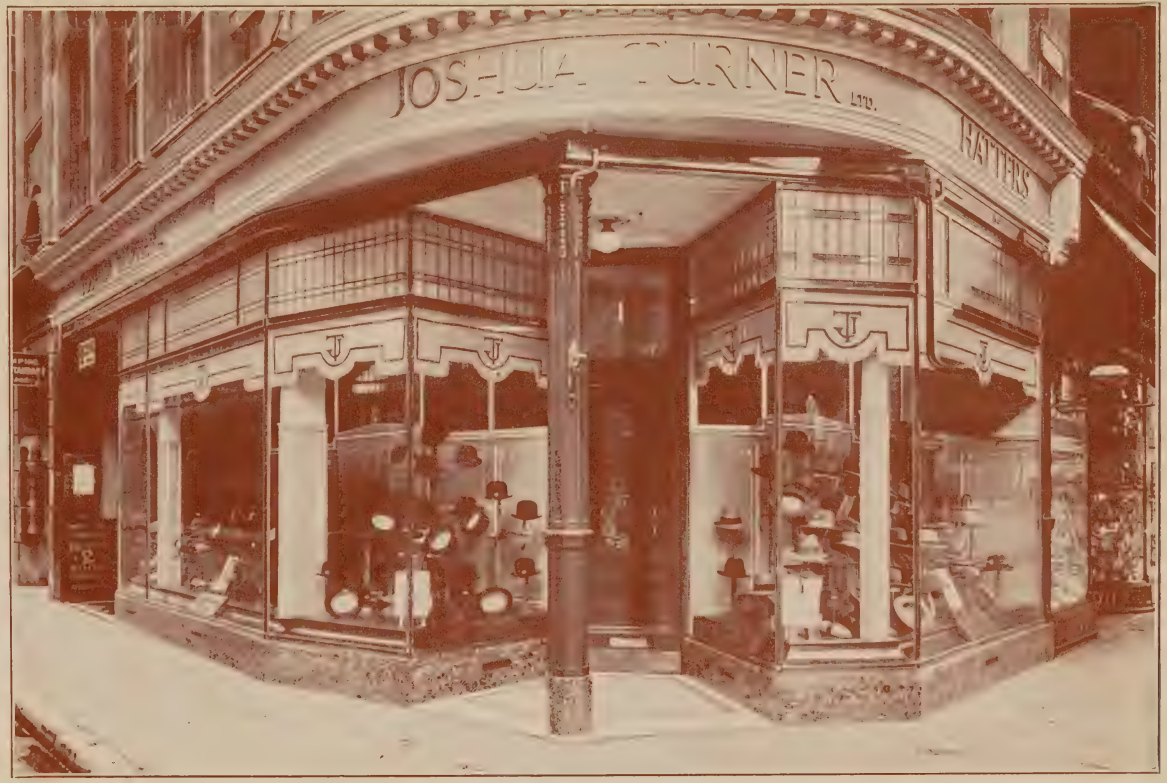


Corporation Electricity Supply Showrooms, Derby.

"Challenge" Copper Glazing supplied to the instructions and designs of Messrs. Fredk. Sage & Co., Ltd., Shopfitters.

Messrs. Grant, Ltd., Croydon.

Copper Glazing to screens supplied to designs and instructions of Messrs. F. Sage & Co., Ltd.



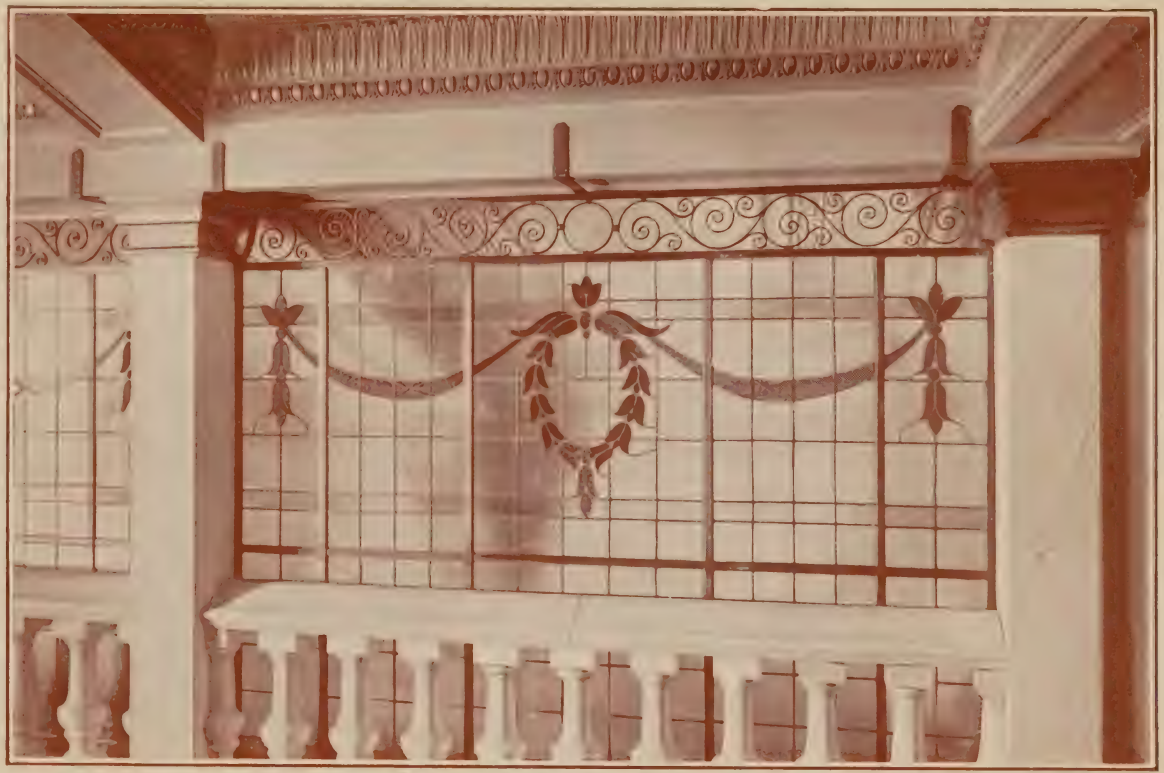
Messrs. Joshua Turner, Ltd., Ludgate Hill, London.

"Challenge" Copper Glazing supplied to the instructions and designs of Messrs. Holttum & Green, Shopfitters.

The Tivoli Theatre, Strand, London.

Ornamental Copper Glazing.

Architect, Bertie Crewe, Esq.



The Tivoli Theatre, Strand, London.

Detail of Ornamental Copper Glazing.

Architect. Bertie Crewe. Esq.

Messrs. Bobby & Co., Ltd., Bournemouth.

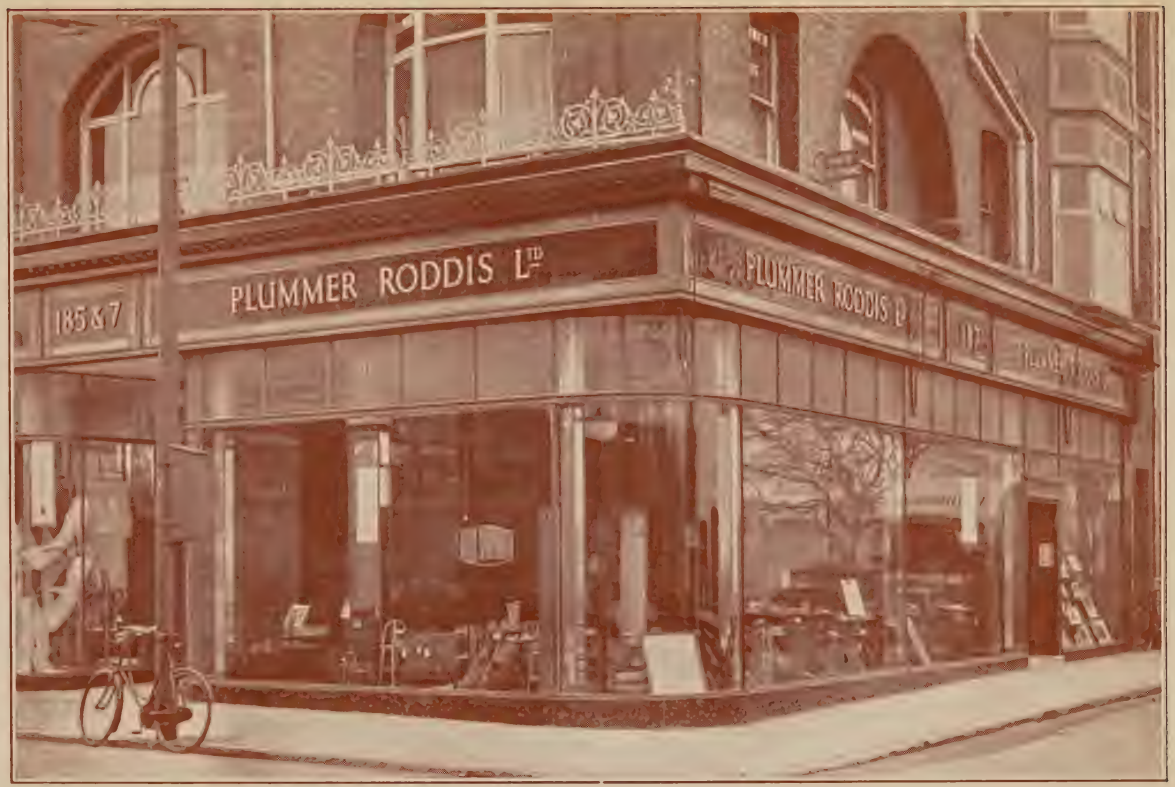
"Challenge" Copper Glazing to Transomes supplied to the instructions and designs of Messrs. Courtney Pope & Co., Ltd.

Messrs. Bobby & Co., Ltd., Bournemouth.

"Challenge" Copper Glazing to Transomes supplied to the instructions and designs of Messrs. Courtney Pope & Co., Ltd.

Messrs. Bobby & Co., Ltd., Bournemouth

"Challenge" Copper Glazing to Enclosures and Vestibule supplied to the instructions and design of Messrs. Courtney Pope & Co., Ltd.



Messrs. Plummer Roddis Ltd., Southampton.

Leaded Lights to Transomes supplied to the instructions and design of Messrs. Courtney Pope & Co., Ltd.

BAKER & WALLS,
13, BIBE LANE
E.C. 4.

B/LK
3/75

CHALLENGE

SOUTH WALES AGENTS
& STOCKISTS
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